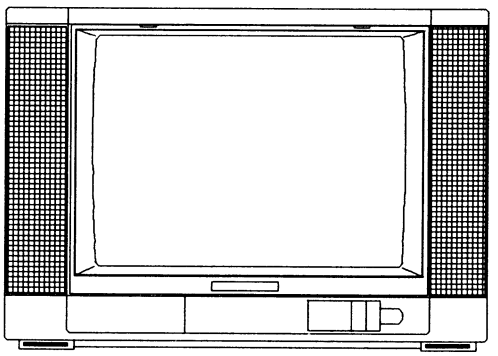
SAMSUNG Electronics

SERVICE MANUAL

CHASSIS: P-58T & RM109

COLOUR TELEVISION RECEIVER



SPECIFICATION

Television System	PAL - B/G , SECAM - B/G , D/K
Receiving Channel	VHF : 2 - 12 UHF : 21 - 69
Intermediate Frequency	Picture I-F Frequency : 38.9MHz Sound I-F Carrier Frequency : 33.4MHz (PAL,SECAM-B/G) Sound I-F Carrier Frequency : 32.4MHz (SECAM-D/K) Colour Sub-carrier Frequency : 34.47MHz
Picture Tube	51GGB91X
Power Requirements	AC 220V , 50Hz
Power Consumntion	83 WATT
Speaker	Impedance : 8 Ohm , 3W
Features	P58T, RM109 TELETEXT & REMOCON SYSTEM

SAFETY CAUTION :

Before servicing this chassis, it is important that a service technician reads and follows the "Safety Precaution" and "Product Safety Notice" in this Service Manual.

* For continued X-radiation, replace the picture tube with original type.
* Design and specifications are subject to change without prior notice.
* WARNING-SHOCK HAZARD - use an isolation transformer when servicing.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The replacement parts which have these special safety characteristics are identified in this manual and supplements;electrical components having such features are identified.
Before replacing any of these components, read the parts list in this manual carefully. The use of subsititute parts which do not have the same safety characteristics in the parts list may create a shock, fire, X-radiation or other hazards.

SERVICE NOTES

1. When replacing the parts or the circuit boards, lamp the lead wires to the terminals before soldering.
2. When replacing a high wattage resistor (oxide metal film resistor) in the circuit board, keep the resistor 10mm (1/2 in.) away from the circuit board.
3. Keep the wires away from high voltage or high temperature components.
4. If any Fuse in this TV receiver is blown, replace it with the FUSE specified in the chassis parts list.

X-RADIATION PRECAUTION

1. The excessive high voltage can produce potentially hazardous X-REDIATION. To avoid such hazards, the high voltage must not be above the specified limit. The normal value of the high voltage of this receiver is 24.5Kv at zero beam current (minimum brightness). The high voltage must not, under any circumstances, exceed 25.5KV. Each time a receiver requires servicing, so the high voltage should be checked follwing the HIGH VOLTAGE CHECK procedure in this manual. It is recommended that the reading of the high voltage should be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
2. The only source of X-RADIATION this TV receiver is the picture tube. For continued X-RADIATION protection, the replacement tube must be exactly th same type as specified in the parts list.
3. Some parts in this receiver have special safety-related charactridtics for X-RADIATION protection. For continued safety, the parts replacement should be undertaken only after referring to the PRODUCT SAFETY NOTICE.

SAFETY PRECAUTION

WARNING: Service should not be attempted by anyone unfamiliar with the necessary precautions in this receiver. The following are the necessary precautions to be observed before servicing.

Since the chassis of this receiver is directly connected to the AC power line-(Hot chassis), an isolation transformer should be used during any dynamic service to avoid a possible shock hazard.

1. Always discharge the picture tube anode to the CRT conductive coating before handling the picture tube. The picture tube is highly evacuated and if broken, the glass fragments will be violently expelled.
2. Use the shatterproof goggles and keep the picture tube away from the bare body while handling. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as non-metallic control knobs, covers, shields,isolation resistor- capacitor network, etc.
3. Before returning the set to the customer, always prefrom an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminal, screeheads, metal overalways, control shafts, etc. To be sure that the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a AC outlet (do not use a line isolation transformer during this check). Use an AC volmeter having 5000 ohm per volt or more sensitivity in the following manner. Connect a 1500 ohm 10watt resistor, paralled by a 0.15uF, AC type capacitor, between a known good earth ground (water pipe, conduit etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and 0.15uF capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. The voltage measured must not exceed 0.3 volts RMS. This corresponds to 0.2 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.

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CONTROL FUNCTIONS

1. MASTER SWITCH (⏻)

Press the MASTER SWITCH once and the STANDBY INDICATOR will light. A further press turns the set off..

Note :

If you are leaving the house for a long period of time, turn the set off with the MASTER SWITCH.

2. CHANNEL/PROGRAMME UP OR DOWN (- C/P +)

Press once to increase or decrease the programme by one.

When the set is in the STANDBY MODE, pressing the C/P UP or DOWN buttons will switch the set "on"

3. VOLUME UP OR DOWN (− ◢ +)

Press the ' + ' button to increase the sound level.

Press the ' - ' button to decrease the sound level.

4. MANUAL TUNING UP OR DOWN (MT ⟶ + , - ⟵ MT)

Normally the MANUAL TUNING is not needed, but it can be useful under extreme (poor) signal conditions when search tuning has failed.

The ON SCREEN DISPLAY (OSD) will show during manual tuning.

5. PICTURE MODE COMMAND (▭)

Allows adjustment of the BRIGHTNESS (☼), COLOUR (◕), CONTRAST (◑) and VOLUME (◢). In sequence, the display will show the appropriate symbol in Red and the level indication in Green. The level setting is adjusted with the volume + and volume – buttons. Each press on the PICTURE MODE COMMAND button will display a different function ready for adjustment with the volume + and – buttons. The on screen display will disappear automatically after a short period and the action of the volume + and – will revert to control of the volume only.

6. SEARCH UP BUTTON (⏭)

To start a search, the user has to press this "SEARCH" button. The OSD will show the currently selected band and analogue indication bar.When the tuning reaches the top of a band, it will change to the next higher band. To speed up the search this set has a possibility to change quickly to search the next band. If user presses this "SEARCH" button and keeps it pressed during 3 seconds, the system will change to the next band. Keeping the key pressed be will get a new band every second.

7. STORE (◇)

Used to store the selected COLOUR, BRIGHTNESS, CONTRAST, VOLUME and Programme Numbers.

8. CLEAR (X)

Used to clear previous settings of COLOUR, BRIGHTNESS, CONTRAST, VOLUME and erase Programme Numbers.

9. PERSONAL PRE - SET (▶□◀)

Used to re-set previously stored levels of COLOUR, BRIGHTNESS, CONTRAST and VOLUME.

10. SLEEP TIMER (◴)

The television may be programmed to switch into standby after a set period. When the SLEEP KEY is pressed the OSD will show "OFF" and Red, and further presses will show time settings in increments of 15 minutes.
The period required may be selected and the display will disappear automatically after three seconds.
Three presses on the RECALL button will enable a further sleep time or "OFF" to be selected.

--- OFF ---> 15 ---> ---> 30 ---> 45 ---> ---> 60 ---> 75 ---> 90 ---> ---> 105 ---> ---120 ---

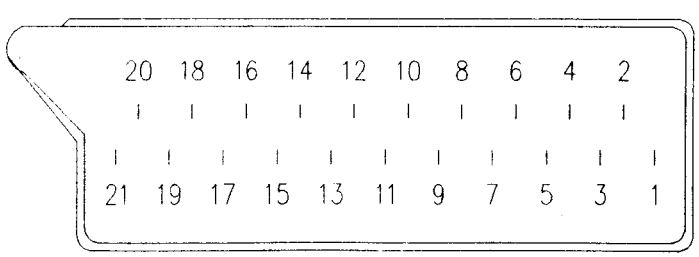
11. PIN CONNECTION OF EURO-AV SOCKET (21 PIN PERI) (SCART SOCKET)

Please consult your Dealer if difficulty is experienced in connecting peripheral equipment to your television.

PIN	SIGNAL
1	Audio Output R
2	Audio Input R
3	Audio Output L
4	Audio Chassis Return
5	Video Chassis Return (R.G.B Blue)
6	Audio Input L
7	R.G.B Blue Input
8	Switching Pin Video
9	Video Chassis Return (R.G.B Green)
10	- - -
11	R.G.B Green Input

PIN	SIGNAL
12	- - -
13	Video Chassis Return (R.G.B Red)
14	- - -
15	R.G.B Red Input
16	Blanking Signal (R.G.B Switching)
17	Video Chassis Return
18	Blanking Signal Ground
19	Video Output
20	Video Input
21	Screening Chassis Return

Automatic video switch is provided via Scart Pin 8.



NOTE :

The set will automalically switch into standby after 5 minutes if no signal is received.

TUNING

There are 40 programme positions (0-39) available against which channels may be stored. The programme numbers are selected with the keys numbered 0-9 on the handset. After switch on the system will accept single digit keys, i.e. 0-9, and it will be necessary to press the DUAL (– – / –) KEY so that numbers 10-39 can be selected. The programme may be changed using the UP/DOWN buttons on the television or handset.

Only stored numbers are displayed in sequential order.

OPERATION

1. Press SEARCH KEY (⊡⊡) the OSD will show the tuning band in Green and the tuning position bar will "search" up the band. The tuning will stop at every station of sufficient signal strength, A further press on the SEARCH KEY will commence the channel search once again.

2. When the required channel has been found, press STORE (◇) and the screen display will show "STORE" in Red letters and a yellow bar.

3. Press channel UP or DOWN (C/P) to select the programme number against which the channel is to be stored. The number will appear on the OSD next to "STORE".

4. Press STORE (◇) again and the screen display will show STORE in Green letters, indicating that the information has been stored. The on screen display will disappear automatically.

STORE AND CLEAR PROCEDURE

TO STORE PERSONAL PRE-SET LEVELS

1. Adjust levels using Remote Control or via Television using ⊡◯⊡ and Volume + or – .

2. Press (◇)
   Screen display shows store in Red.

3. Press (▶⊏◀)
   Screen display shows store in Red and PP in Green.

4. Press (◇)
   Screen display shows store and PP in Green. Levels are now stored. The on screen display disappears automatically.

TO CLEAR A PRE-TUNED CHANNEL

1. Press (X)
   CLEAR is shown in Red.

2. Select channel number using channel + or - (or via Remote Control). Number indicated next to "CLEAR".

3. Press (X)
   "CLEAR" goes Green. The memory for that channel is now vacant.

   The on screen display disappears automatically.

NOTE

Only channel numbers which are stored will be displayed, and are sequentially accessed. If the Remote Control is used and a number selected which has been cleared, then "CLEARED" is displayed on screen.

TO CLEAR PERSONAL PRE-SET LEVELS

1. Press (X)
   CLEAR is shown in Red.

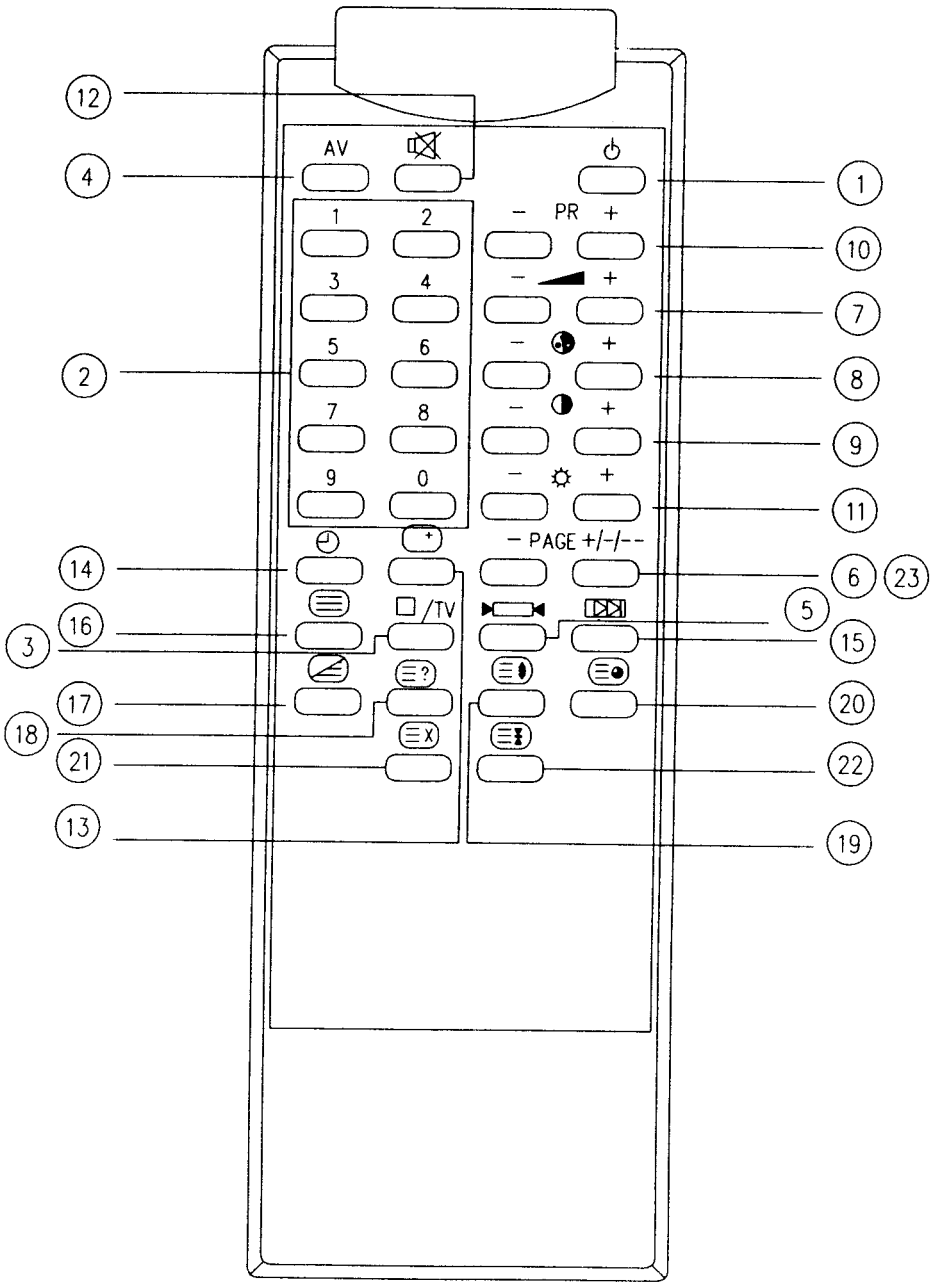
2. Press (▶□◀)
   CLEAR is shown in Red and PP in Green.

3. Press (X)
   CLEAR and PP are shown in Green.
   Levels are now returned to Factory pre-set levels of : –

VOLUME	20% Mute Removed.
BRIGHTNESS	65%
COLOUR	65%
CONTRAST	50%

   The on screen display disappears automatically.

REMOTE CONTROL TRANSMITTER



REMOTE CONTROL OPERATION

1

STAND-BY (⏻)
Press this button to switch the TV into stand-by for short periods..

2

DIRECT PROGRAMME SELECTION
Numbered keys 0 ~ 9 used to select programme numbers.
The receiver will come out of stand-by automatically when any programme number is selected.

3

TV SELECTION (TV)
Press this button to change back from AV and/or TTX to TV.

4

AV SELECTION (AV)
Selects Audio/Video input via Euro (Scart) socket.

5

PERSONAL PRE-SET (▶▭◀)
Resets Colour, Bright, Contrast and Volume to personal pre-set levels.

6

SINGLE/DUAL DIGIT (-/--)
Press this button to select double figures programme position (10 - 39).

7

VOLUME UP/DOWN (– ◢ +)
Press the " + " button to increase the sound level.
Press the "–" button to decrease the sound level.

8

COLOUR UP/DOWN (– ◑ +)
Press the " + " button to increase the colour level.
Press the "–" button to decrease the colour level.

9

CONTRAST UP/DOWN (- ◑ +)
Press the " + " button to increase the contrast level.
Press the "–" button to decrease the contrast level.

10

PROGRAMME SELECTION (– C/P +)
Allows sequential selection and brings receiver out of stand-by.
Only the programme numbers which are stored in the memory
are displayed on the screen.

11

BRIGHTNESS UP/DOWN (– ☼ +)
Press the " + " button to increase the brightness level.
Press the "–" button to decrease the brightness level.

12

MUTE (🔇)
Press this button to mute the sound. A further press restores sound.
Pressing the volume " + " or "–" buttons will also restore sound
if the set is in mute.

13

RECALL (⮌)
One press – Displays channel number.
Second press – Displays the amount of time remaining in the sleep mode.
The on screen display cancels after 5 seconds.

14

OFF TIMER (◴)
Enables the receiver to be programmed to switch into
stand-by after a set period of time.

15

SEARCH UP (⏭)
To start a search, the user has to press this "SEARCH" button. The OSD will show the currently selected band and analogue indication bar.When the tuning reaches the top of a band, it will change to the next higher band. To speed up the search this set has a possibility to change quickly to search the next band. If user presses this "SEARCH" button and keeps it pressed during 3 seconds, the system will change to the next band. Keeping the key pressed be will get a new band every second.

16

TEXT ( )
Press this button to change from TV to TELETEXT mode.

17

MIX ( )
Press this button to superimpose TELETEXT picture into the TV display.

18

REVEAL ( )
Press this button to reveal hidden words e.g. quiz pages with hidden answers.
Press this button, than hidden words disappear.

19

SIZE ( )
Press this button to expand the TOP half of the display.
Press again to expand the BOTTOM half of the display.
Press again to return the display to normal size.

20

TIME TEXT ( )
Select the TELETEXT alarm page or TELETEXT subpage. Press the TIME TEXT button S**** will be displayed on the screen, now enter the time or subpage number at which this page should be displayed, using buttons 0 - 9 on the remote control. To cancel this feature, press the TIME TEXT button again to restore the initial time status S****.

21

CANCEL ( )
While searching for a TELETEXT page, the TV display can be viewed by pressing this button. When the page has been found, the page number will be displayed in a box at the TOP left hand side of the picture.

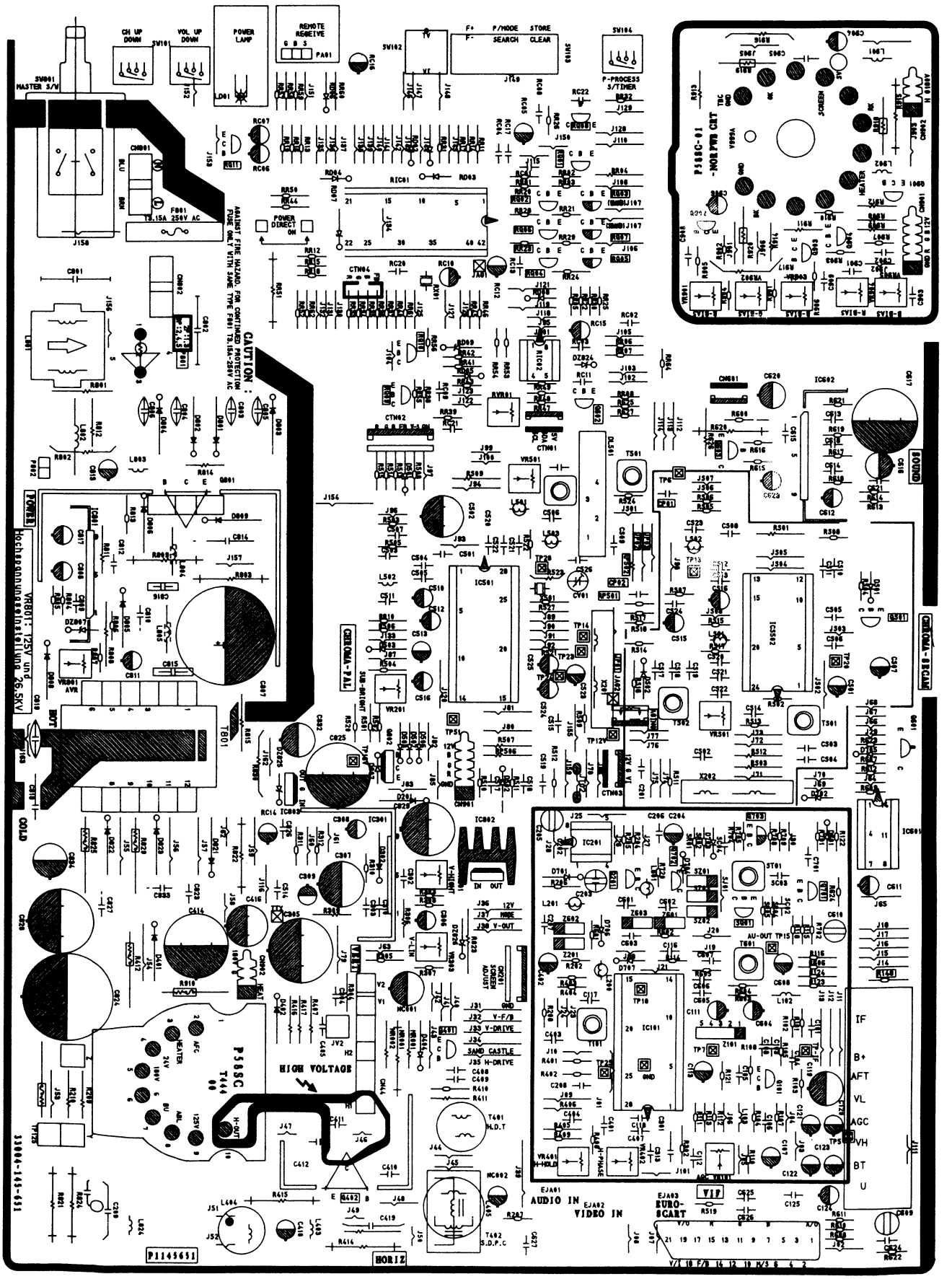
22

HOLD ( )
When TELETEXT information exceeds more than one page, the display changes automatically to the next page. To hold a particular page, press this button. This display will remain until the HOLD button is pressed again.

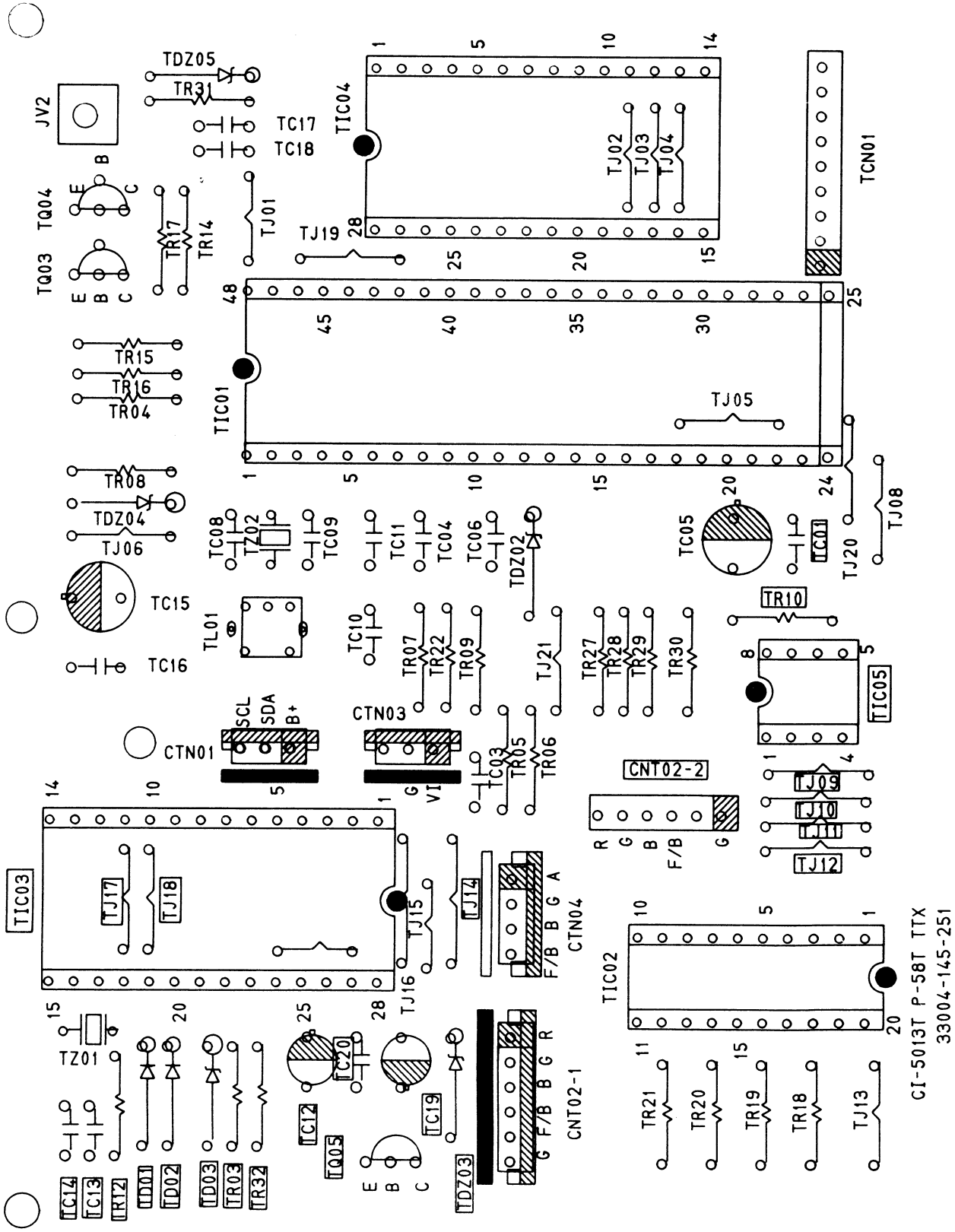
23

PAGE UP/DOWN
On selecting page number i.e. page 600, the next two adjacent page numbers (page 599 and 601) are stored automatically. Selection of these pages is achieved by using page – and + buttons.
Note :
On changing from 600 to 599 for example then page 598, 599 and 600 are stored.

PARTS LOCATION DIAGRAM (PWB-MAIN)



PARTS LOCATION DIAGRAM (PWB-TELETEXT)



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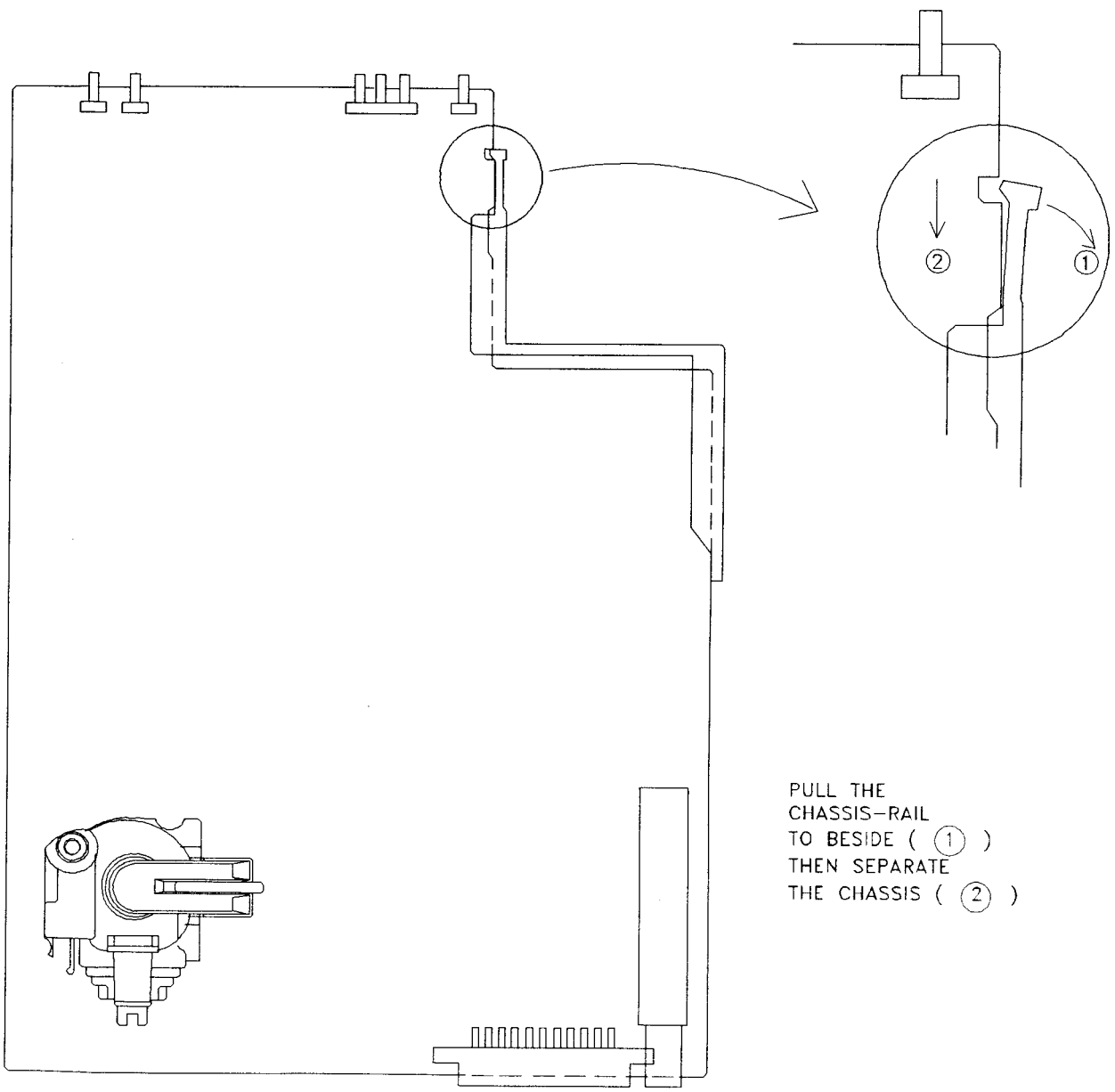
THE SEPARATION OF CHASSIS



INSTALLATION AND SERVICE ADJUSTMENTS

1. GENERAL INFORMATIONS

All adjustments are thoroughly checked and corrected when the receiver leaves the factory. Therefore, the receiver should operate normally and produce proper colour and B/W picture upon installation. However minor service adjustments may be required depending on the particular location in which the receiver is operated. This receiver is shipped completely in cardboard carton. Carefully draw out the carton and remove all the packing materials.
Plug the power cord into a convenient two pin power outlet. Turn on the receiver and adjust the fine tuning for the best picture detail.
Check and adjust all the customer controls such as BRIGHTNESS, CONTRAST and COLOUR Controls to obtain the natural colour or B/W

2. AUTOMATIC DEGAUSSING

A degaussing coil is mounted around the picture tube so that external degaussing after moving the receiver is normally unnecessary, providing the receiver is properly degaussing upon installation. The degaussing coil operates for about 1 second after the power to the receiver is switched ON.
If the set is moved or faced in a different direction, the power switch must be switched off at least 10 minutes in order that the automatic degaussing circuit operates properly.
Should the chassis or parts of the cabinet become magnetized and cause the poor colour purity, use an external degaussing coil. Slowly move the degaussing coil around the face-place of the picture tube, the sides and the rear of the receiver and slowly withdraw the coil to distance of about 2 m before disconnecting it from AC source. If colour shading still persists, perform the COLOUR PURITY ADJUSTMENT and CONVERGENCE ADJUSTMENTS procedures as mentioned later.

3. HIGH VOLTAGE CHECK

CAUTION: There is no HIGH VOLTAGE ADJUSTMENT on this chassis. But B+ power must be adjusted in +125V under the full colour bar pattern and the normal picture control level.

1) Connect an accurate high voltage meter to the second anode of the picture tube.
2) Turn on the receiver. Set the BRIGHTNESS and CONTRAST control to minimum (zero beam).
3) The high voltage should be measured less than 25KV.
4) Rotate the BRIGHTNESS and CONTRAST controls to both extremes to be sure that the high voltage does not exceed the limit of 25.5KV under any conditions.

4. +B (+125V) ADJUSTMENT

1) Receive the lion-head pattern.
2) Set the Bright and Contrast condition to maximum.
3) Connect Digital voltmeter to R821.
4) Adjust the VR801 to +125V.

5. HORIZONTAL OSCILLATOR ADJUSTMENT

If there is an indication of unstable horizontal sync, adjust the HORIZONTAL HOLD control (VR401) to remove the condition. When you adjust the Horizontal Hold control, you should short TP25 and GND for the H-oscillator adjustment.

6. HORIZONTAL PHASE ADJUSTMANT

If you want to move the center of picture, adjust HORIZONTAL phase control (VR402).

7. VERTICAL HEIGHT ADJUSTMENT

The SIZE control(VR301) on the main board changes the size of the picture, having an equal effect on the top and bottom.

8. FOCUS ADJUSTMENT

1) Set the Bright and Contrast condition to maximum.
2) Adjust FOCUS Control on FBT for well defined scanning lines in the centre area of the screen.

9. R-F AGC ADJUSTMENT

1) Turn the set in the strongest station in your area.
2) Turn AGC control(VR101) on the IF board fully clockwise position.
3) Adjust AGC control until noise(snow) disappears from the screen.

10. APC ADJUSTMENT

1) Receive the colour bar pattern.
2) Connect TP23 to TP24 with jumper.
3) Control the Trimer CV101 on the main PCB to get the colour.

11. COLOUR PURITY ADJUSTMENT

NOTE: Before attempting any purity adjustments, the receiver should be operated for at least fifteen minutes. The purity adjustment requires Rubber Wedge kit.

1) Demagnetize the picture tube and cabinet using a degaussing coil.
2) Turn the CONTRAST and BRIGHTNESS controls to maximum.
3) Receiver the green colour pattern.
4) Loosen the clamp holding the yoke, and slide the yoke backward or forward to provide the vertical green belt(zone) in the picture screen.
5) Remove the Rubber Wedges.
6) Rotate and spread the tabs of the purity magnet(See Fig. 3) around the neck of the picture tube until a green belt is obtained in the centre of the screen.
   And at the same time, centre the raster vertically by adjusting the magnet.
7) Move the yoke slowly forward or backward until a uniform red screen is obtained. Tighten the clamp screw.
8) Check the purity of the red and bule raster.
9) Tighten the clamp screw of the yoke temporarily.
10) Obtain a while raster referring to "CRT WHITE BALANCE ADJUSTMENT".
11) Proceed with the convergence adjustment.

12. WHITE BALANCE ADJUSTMENT

1) PREPARATION

1 Operate the receiver at least 20 minutes before attempting the white balance adjustment.
2 Connect A.C. line and the receiver power switch sets in "ON" position.
3 Receive a black and white signal (Lion head pattern is better).
4 Set colour control to the center position.
5 Set the brightness and contrast controls to the "PP" position.
6 Set the red, blue and green drive controls to the mechanical center position.
7 Set the blue and green drive controls to the machanical center position.
8 Set the screen VR control on FBT to the minimum position (fully counter-clockwise).

2) STEPS

1 Rotate the SCREEN control on FBT(T444) gradually clockwise until the first horizontal line appears slightly on the screen.
2 Adjust the two CUT-OFF controls to obtain the slightly lighted horizontal line in the same levels of three colours (red,green and blue).The line looks like white if the CUT-OFF controls are adjusted properly.
3 Adjust the blue and green drive controls to obtain the proper white-balanced picture in high light areas.
4 Set the contrast control to the minimum position and turn the brightness control slightly counterclockwise to obtain a dark gray raster. Then check the white balance in low brightness. If the white balance is not enough, repeat the steps (1 - 4) for correct white balance.

13. CONVERGENCE ADJUSTMENT

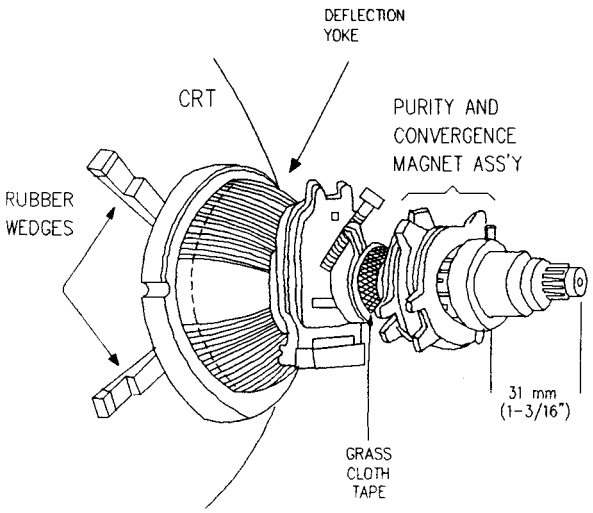
NOTE: Before attempting any convergence adjustment, the receiver should be operated at least for fifteen minutes.

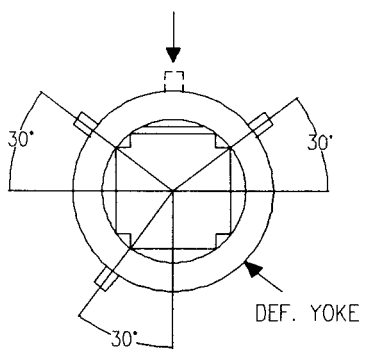
Centre Convergence Adjustment

1) Receive crosshatch pattern with a colour bar signal generator.
2) Adjust the BRIGHTNESS and CONTRAST Controls for a well defined pattern.
3) Adjust the two tabs of the 4-pole Magnets to change the angle between them(See Fig. 2) and superimpose the red and blue vertical lines in the centre area of the picture screen(See Fig. 2).
4) Turn the both taps while at the same time keeping the angle constant and superimpose the red and blue horizontal lines at the centre of the screen(See Fig. 3).
5) Adjust two tabs of 6-pole Magnets to superimpose red/blue line and green one. Adjusting the angle affects the horizontal lines.
6) Due to the interaction between these adjustments, steps 3, 4 and 5 should be repeated until the satisfactory results are obtained.

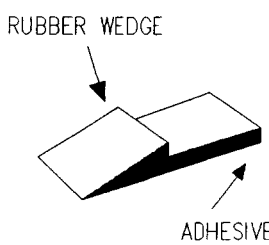
Circumference Convergence Adjustment

1) Loosen the clamping screw of deflection yoke to allow the yoke to tilt.
2) Put a wedge as shown in Fig. 1 temporarily (Do not remove cover paper on adeshive part of the wedge).
3) Tilt the front of the deflection yoke up or down to obtain the better convergence in circumference(See Fig. 3). Push the mounted wedge into the space between the picture tube and yoke to fix the yoke temporarily.
4) Put other wedge into the bottom space and remove the cover paper to stick.
5) Tilt the front of the yoke right or left to obtain the better convergence in circumference(See Fig. 3).
6) Keep the yoke position and put another wedge in either upper space. Remove the cover paper and stick the wedge on picture tube to fix the yoke.
7) Detach the temporarily mounted wedge and put it in another upper space. Stick it on this picture tube to fix the yoke.
8) After fixing three wedges, recheck overall convergence.
   Tighten the screw firmly to fix the yoke and check if the yoke is firm.
9) Stick 3 adeshive tabs on the wedges as shown in Fig. 1.



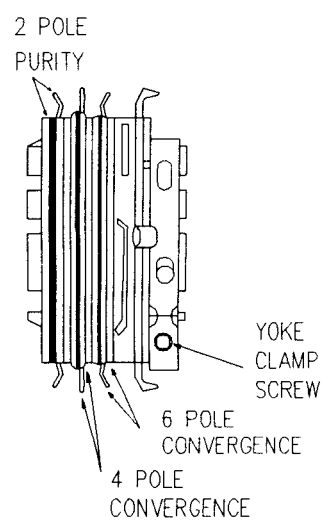


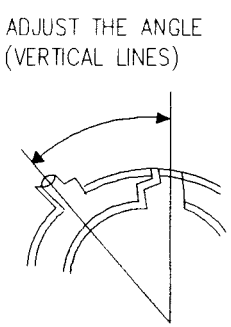
RUBBER WEDGES LOCATION

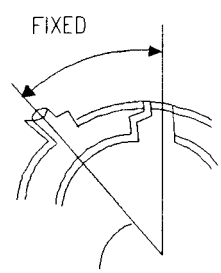


RUBBER WEDGES KIT

Figure 1 TUBE ASSMEBLY







ADJUSTMENT OF MAGNETS

Figure 2 PURITY AND CONVERGENCE MAGNETS

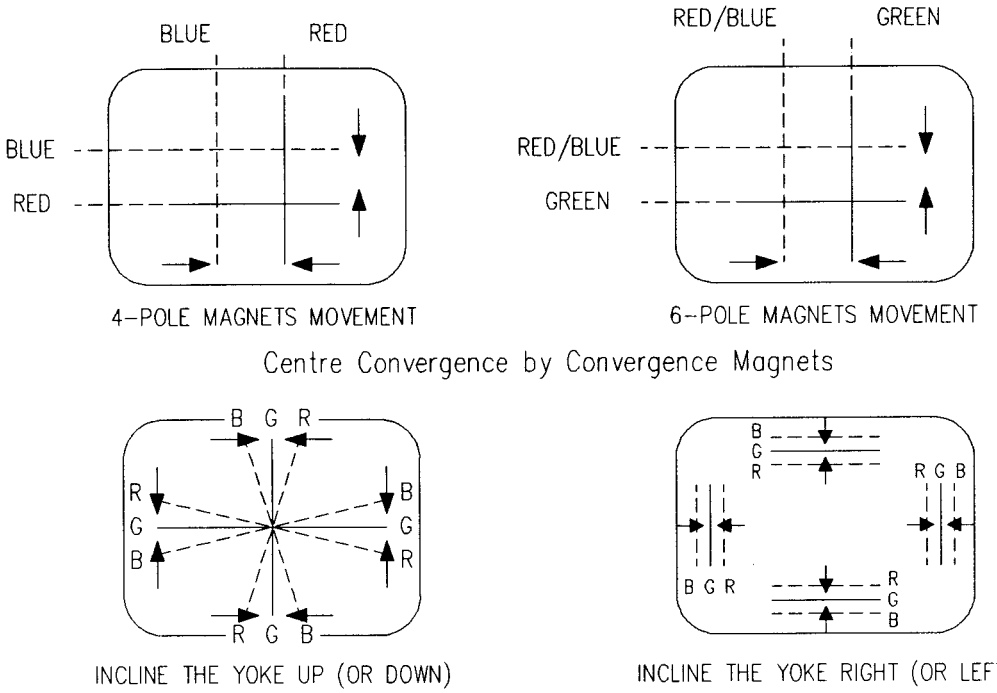


Figure 3. DOT MOVEMENT INSTRUCTIONS

GENERAL ALIGNMENT INSTRUCTIONS

A.GENERAL

The alignment is an exacting procedure and should be undertaken only when necessary. The test equipment specified or its equivalent is required to properly perform the alignment procedures which are outlined on the following pages. The use of equipment which does not meet these requirements may result in the inability to properly align the receiver.
It is essential that bias values as specified are maintained while the alignment to insure proper results.

B. EQUIPMENT TERMINATIONS

The alignment pads are designed for correct matching of the equipment to the circuits involved. The failure to the proper matching will result in representing the ture operation of thereceiver. The pads should be constructed as compactly as possible with all unshielded leads not being in excess of 2.5cm long.

C. SIGNAL OVERLOAD

Since the large excessive of the sweep generator causes the overloading of receiver circuits, first, the output of the sweep generator set to zero and then gradually increase the output until a response is obtained. Further increase changes in configuraton, for example, flattening at the top or dropping below the base line at the botton, decrease the sweep output to restore the proper configuration. The oscilloscope gain should be as high as possible to maintain a useable pattern with the peak-to-peak values specified, thus requiring a lower output from the sweep generator and less change of overload. Insertion of makers from the marker generator should not cause the distortion of the response.

D. TEST EQUIPMENTS

1) PAL PATTERN GENERATOR (PM5518)
2) OSCILLOSCOPE
3) DC POWER SUPPLY (DC range:0-10V,0-20V)
4) MATCHING PAD
5) PROBE (which impedance is 75 ohm)
6) DIGITAL VOLTMETER
7) BNC TO DIN JACK
8) BNC TO BNC CABLE

1. VIF (AFT) ALIGNMENT

1.1 EQUIPMENT

1) Pattern generator (PM5518)
2) DC power supply
3) Digital Voltmeter

1.2 SETTING

1) PM5518: Multiburst pattern 38.9MHz
2) DC power supply: 12V
3) Digital Voltmeter: 10V range

1.3 PREPARATION

1) Connect DC power supply to TP-12 of the Main PCB
2) Connect Digital Vooltmeter to TP-18 of the Main PCB
3) Connect RF out of PM5518 to TP-IF of the Main PCB

1.4 STEPS

1) Adjust the T101 until the Digital Voltmeter is to be 6V.

2. SOUND (5.5MHz DET) ALIGNMENT

2.1 EQUIPMENT

1) Digital Voltmeter

2.2 SETTING

1) Digital Voltmeter: 12V range

2.3 PREPARATION

1) Receive the colour bar pattern and insert 1KHZ modulated Sound Carrier
2) Connect the Digital Voltmeter to AU-OUT

2.4 STEPS

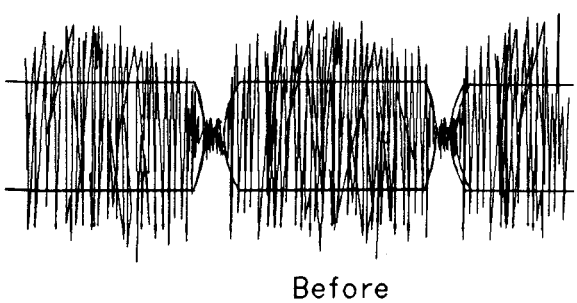
1) Adjust the T601 until the Digital Voltmeter is to be 2.8 + -0.1V.

3. SECAM COLOUR ALIGNMENT (SECAM B/G ONLY)

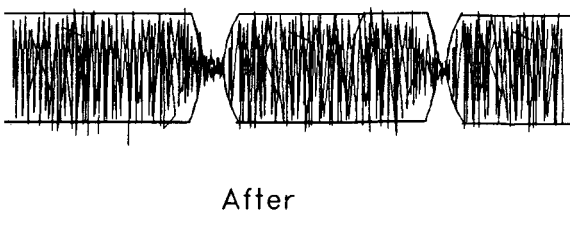
PREPARATION — 1. Setting the trigger mode of the Oscilloscope to EXT. mode, hold the sync. using the induced horizontal voltage.
2. Set the time division of the scope to 20 μs/cm.
3. Set the Vert. Gain to 0.1V/cm.
4. receive SECAM colour pattern.
5. The Colour, Brightness,and Contrast control to the maximum position.

3.1 BELL FILTER ALIGNMENT

1) Connect the probe (10:1) of the scope to ICS502 "4" pin.
2) Adjust TS01 so that each bar of (R-Y) and (B-Y) becomes even respectively(Fig. 1).



Before



After

Fig. 1

4. PAL COLOUR MATRIX ADJUSTMENT

4.1 The using measurer

1) Oscilloscope (10:1 PROBE)

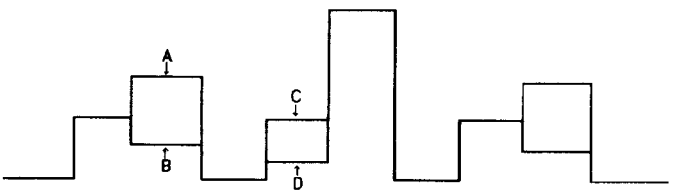
4.2 The adjustment preparation

1) Pal colour demodulator pattern receiving
2) Connect the oscilloscope to pin 16 of PWB-Main Board IC501 (TDA3561A).
3) Set the Colour, Contrast Max, Bright to the proper brightness

4.3 The Adjustment

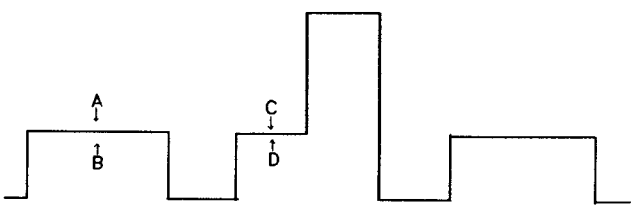
1) By turning VR501, make A consistent with B.

Before



2) By turning T505, make C consistent with D.

After



5. THE QUADRATURE REFERENCE (DR/DB, SECAM B/G ONLY)

5.1 The using measurer

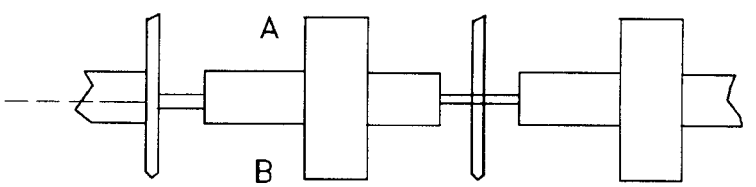
1) Oscilloscope (10:1 PROBE)

5.2 The application preparation

1) Secam Philips pattern receiving
2) Connect the oscilloscope probe to pin 14 of the PWB Main Board ICS502 (TDA3590A).
3) Set the Colour/Contrast Max, Bright to the proper brightness.
4) Set VRS01 to the center.

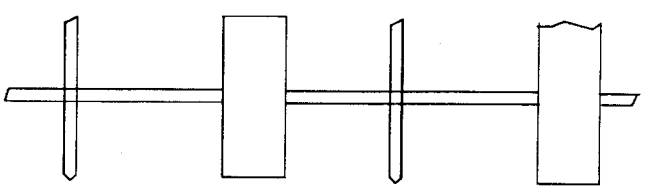
Before

REFERENCE LEVEL



After

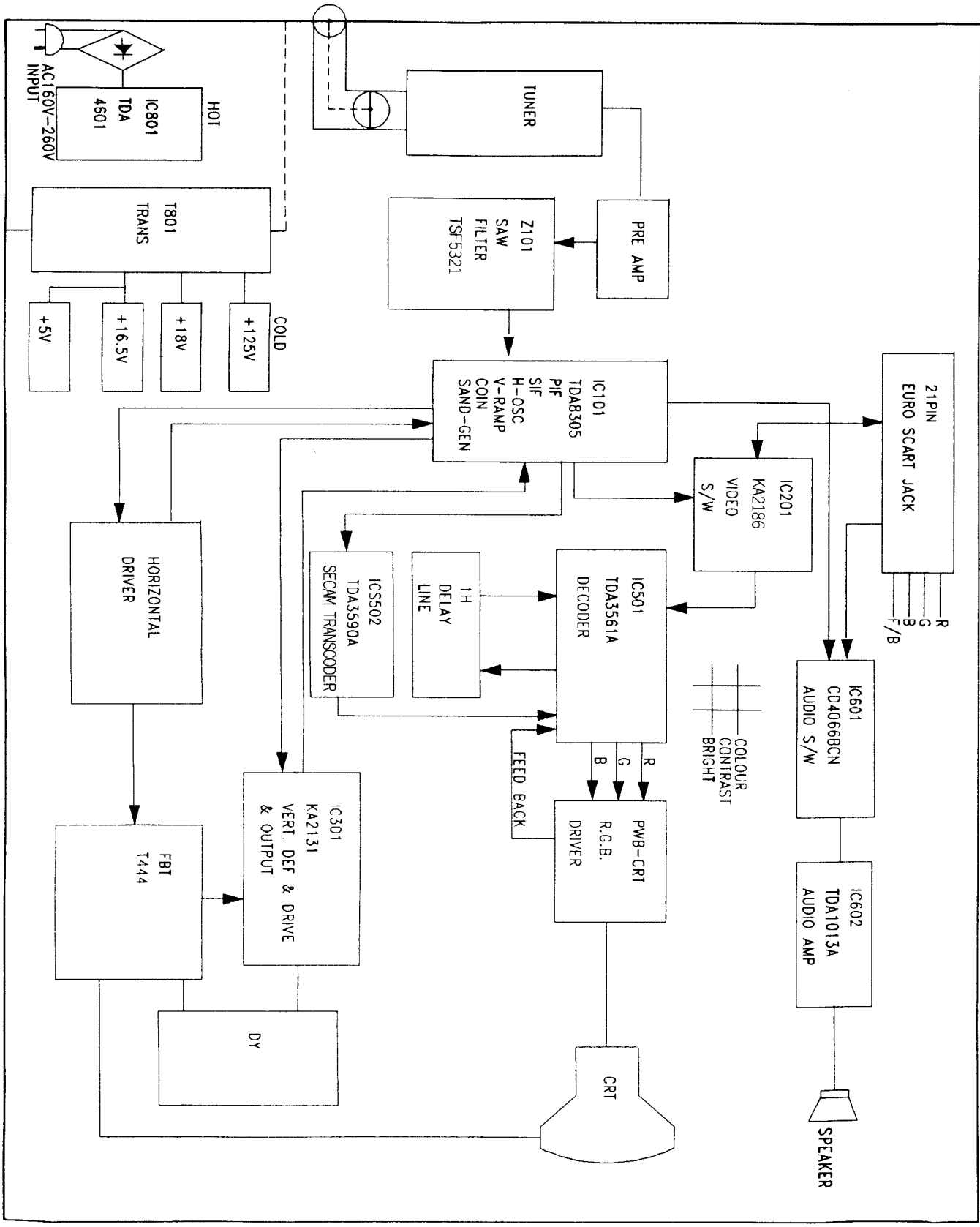
REFERENCE LEVEL



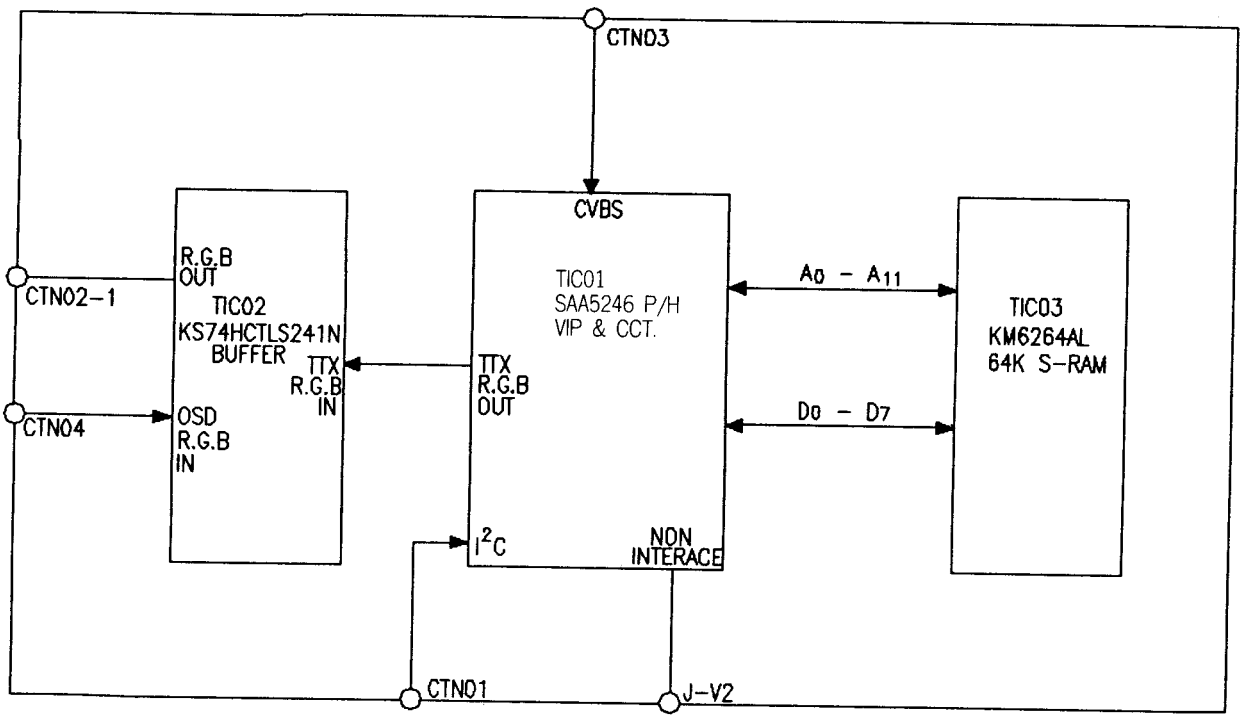
5.3 The Adjustment

1) By adjusting TS02, make B-Y line consistent with REF LEVEL by adjusting.
2) Move the oscilloscope probe to pin 13 of IC502.
3) By adjusting VR502, make R-Y Line consistent with REF LEVEL by adjusting.

CHASSIS BLOCK DIAGRAM



TTX BLOCK DIAGRAM

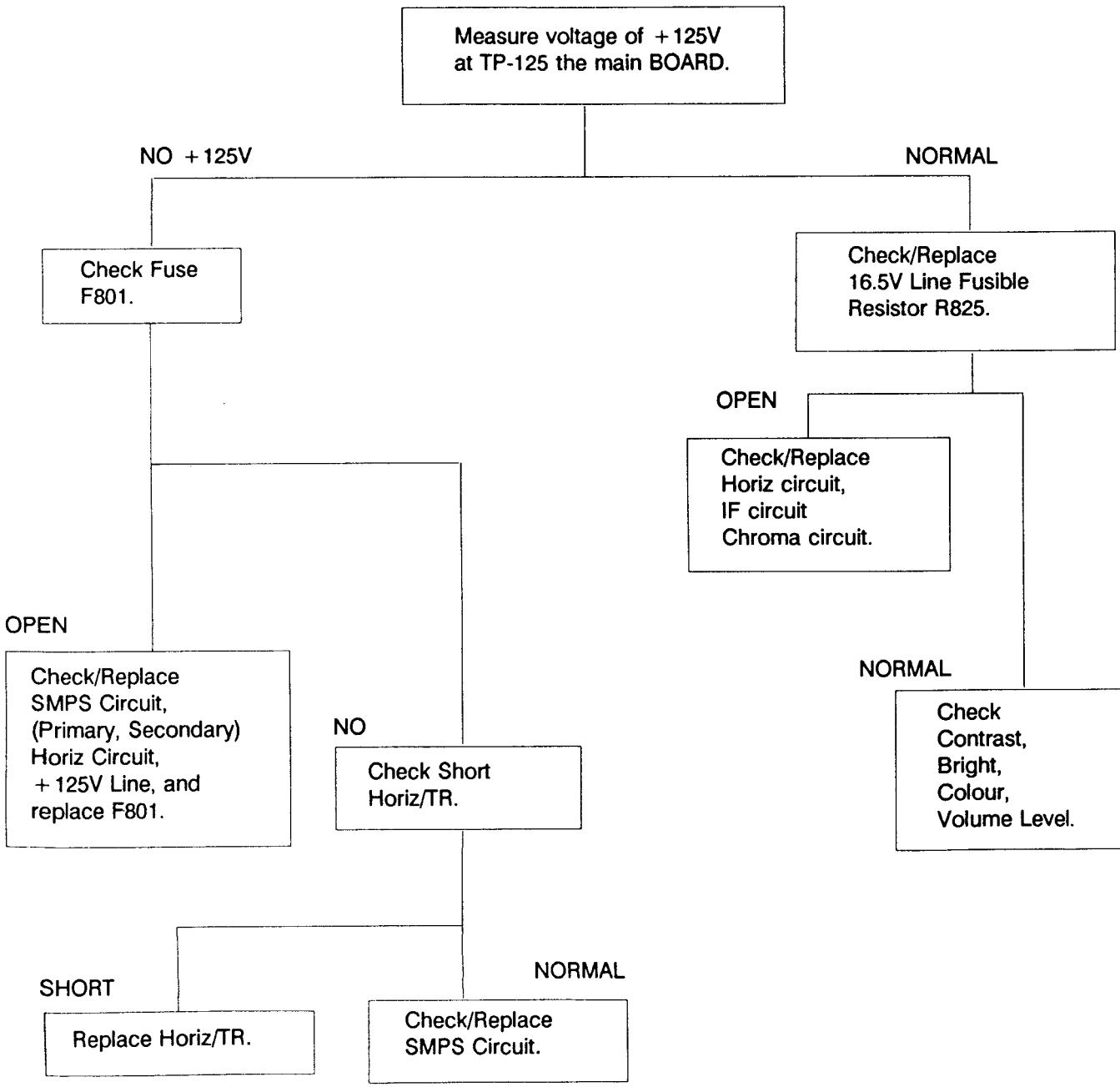


TROUBLE-SHOOTING CHARTS

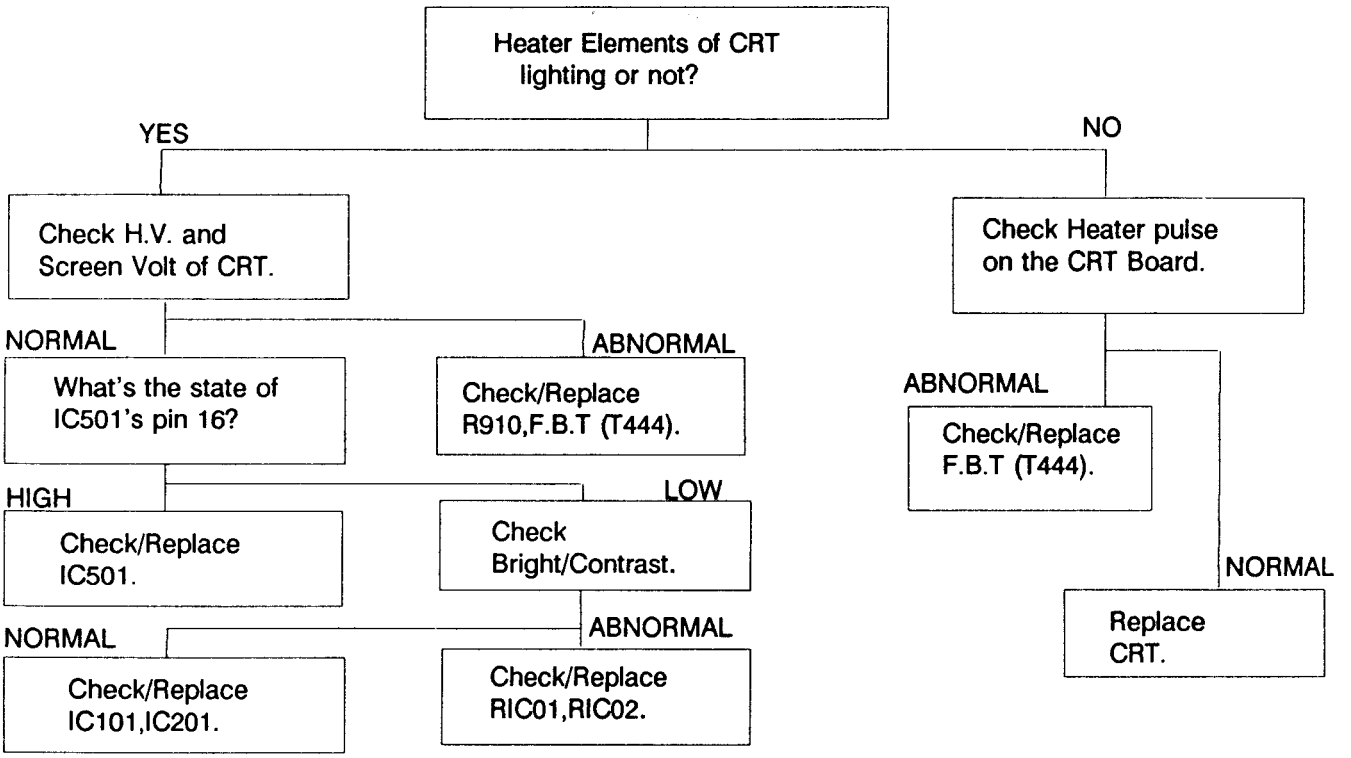
The following charts are devoted to the trouble-shooting which, if followed carefully, will assist you in tracking down a fault to the correct stage.
In order to utilize the charts (fault trees), first establish the complains, i.e.-No Raster, No Sound.

Locate the chart applicable and then, progress through the various alternatives until a final block indicates the defective components or stages.

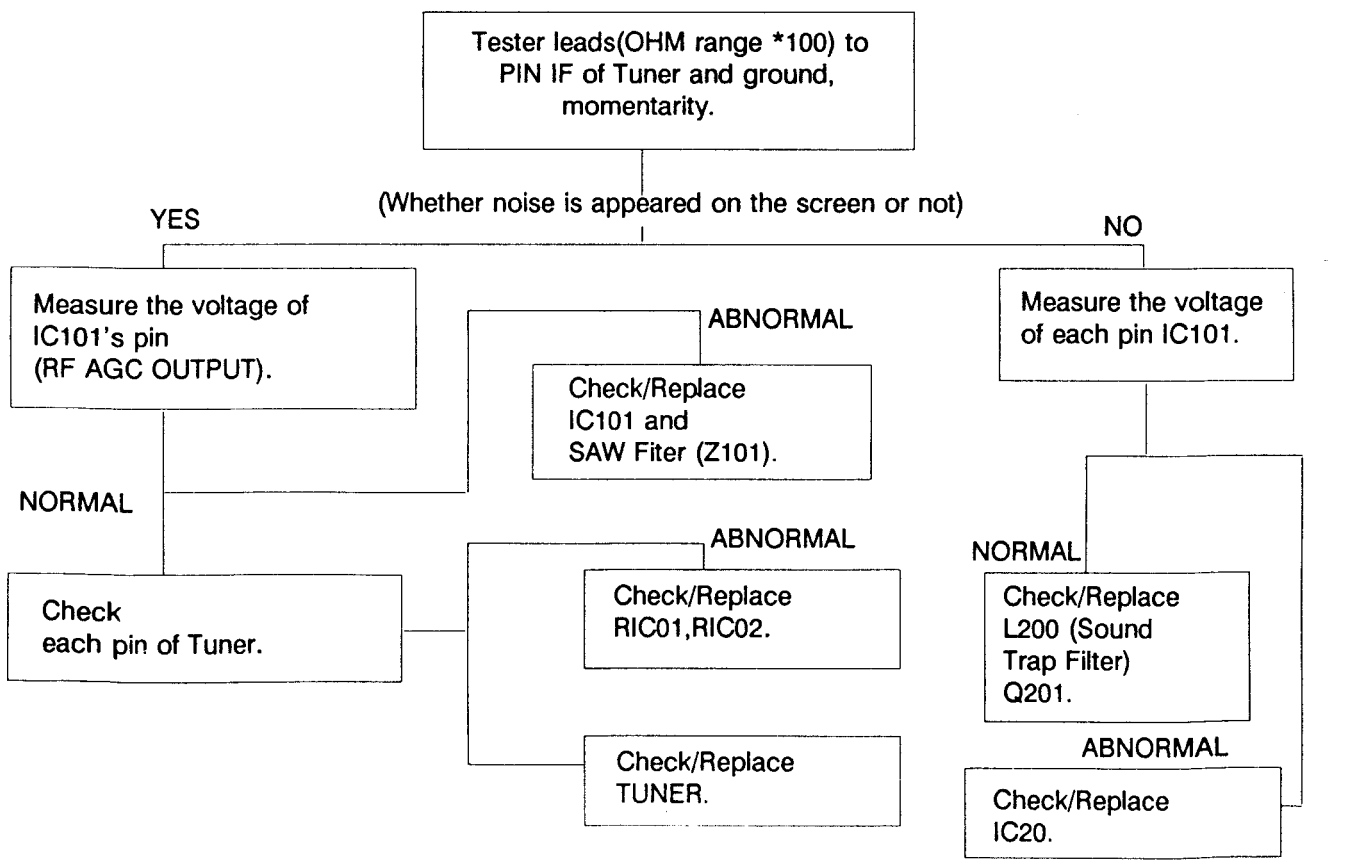
NO RASTER AND NO SOUND



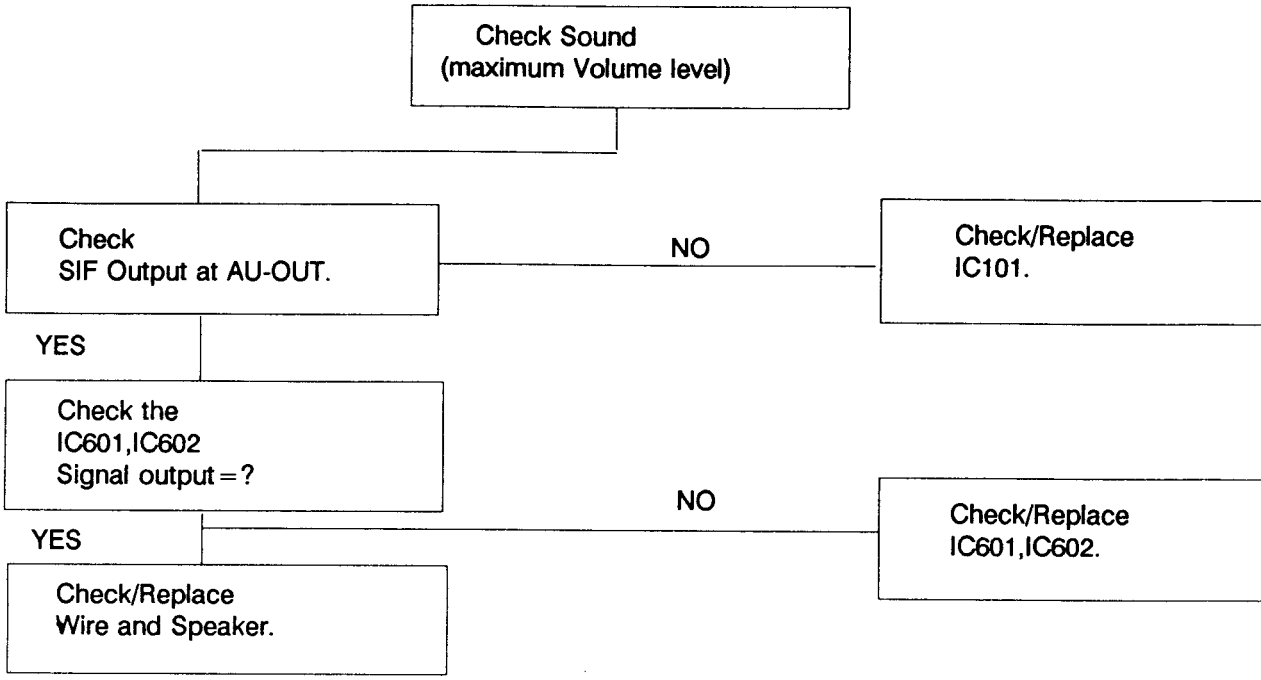
NO RASTER (SOUND OK)



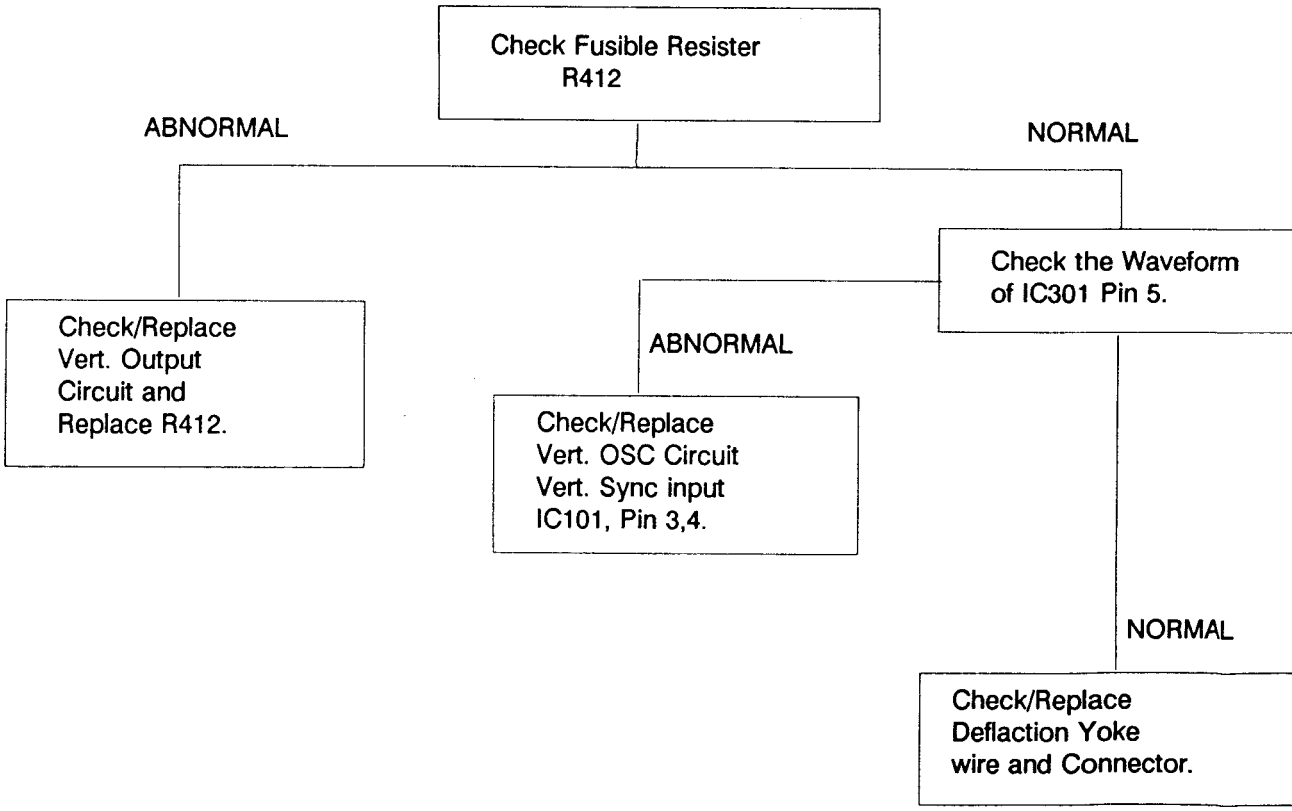
NO PICTURE (RASTER ON) AND NO SOUND



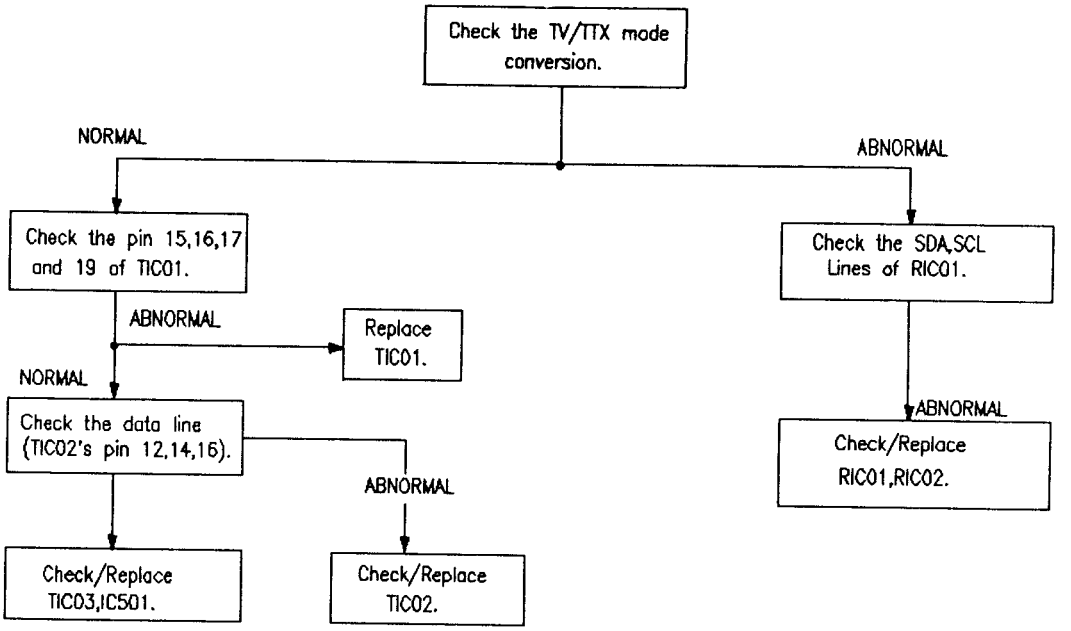
NO SOUND (PICTURE OK)



NO VERT.SCAN (ONE HORIZ.LINE RASTER)



NO TELETEXT


Check the TV/TTX mode conversion.
NORMAL
ABNORMAL
Check the pin 15,16,17 and 19 of TIC01.
Check the SDA,SCL Lines of RIC01.
ABNORMAL
Replace TIC01.
NORMAL
ABNORMAL
Check the data line (TIC02's pin 12,14,16).
Check/Replace RIC01,RIC02.
ABNORMAL
Check/Replace TIC03,IC501.
Check/Replace TIC02.

RM109 REMOCON FEATURES

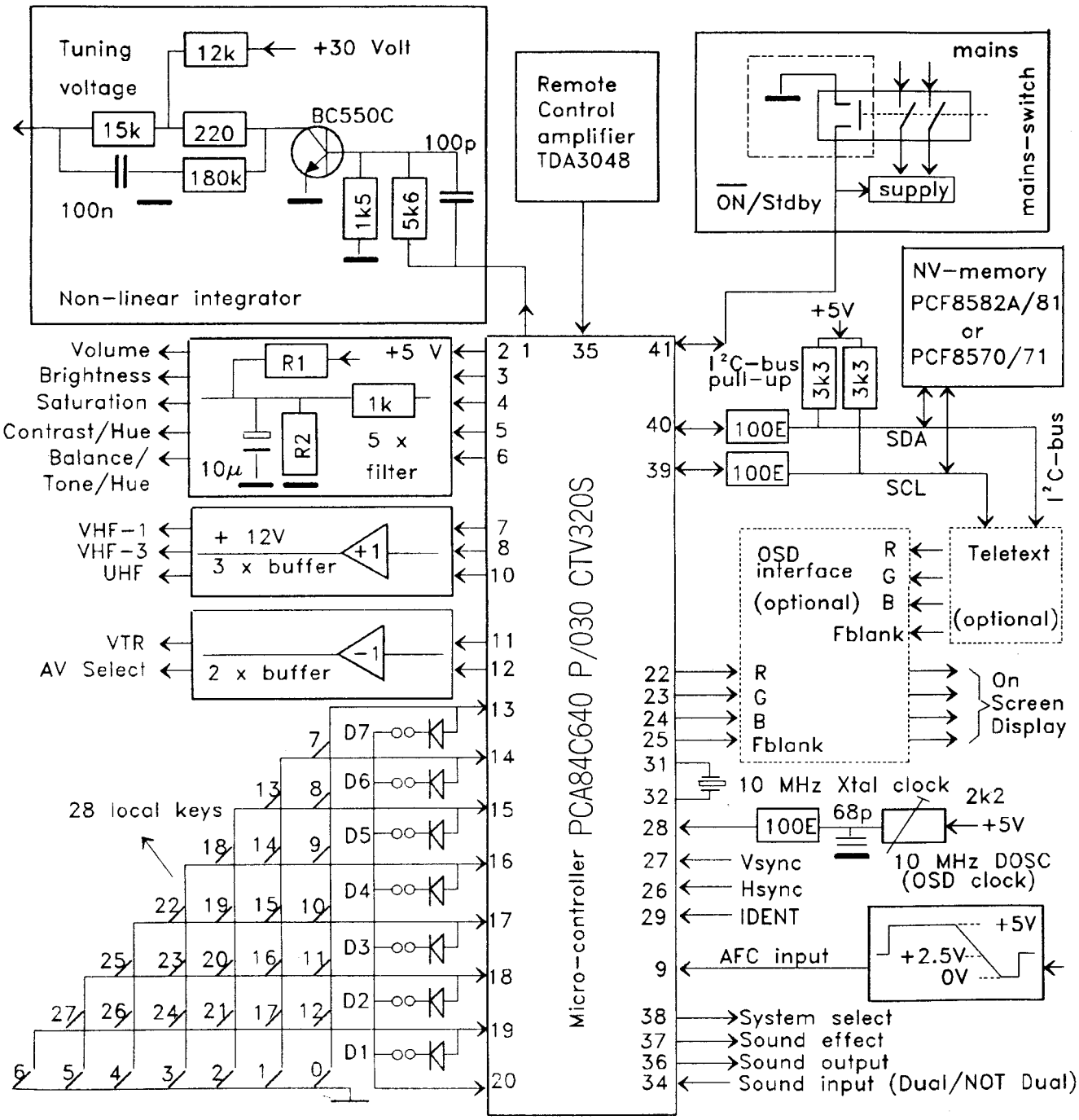


Diagram of PCA84C640 P/030 in CTV320S.

PIN FUNCTION CHART FOR RM109

1	DP00/TDAC	VTUNN	tuning voltage control output
2	DP01/PWM1	VOL	volume control output
3	DP02/PWM2	BRI	brightness control output
4	DP03/PWM3	SAT	saturation control output
5	DP04/PWM4	CON/HUE	contrast or hue control output
6	DP05/PWM5	BAL/TON/HUE	balance, tone or hue control output
7	P10 1) 2)	VHF-L	band-switch VHF-low output
8	P11 1) 2)	VHF-H	band-switch VHF-high output
9	DP17/AFC	AFC	analogue AFC sense input
10	P12 1) 2)	UHF	band-switch UHF output
11	P13 1)	VTR	VTR time constant control output
12	P14 1)	AV	ext./int. /Audio/Video source control output
13	P00 1)	KEYB0	keyboard scan line input/output
14	P01 1)	KEYB1	keyboard scan line input/output
15	P02 1)	KEYB2	keyboard scan line input/output
16	P03 1)	KEYB3	keyboard scan line input/output
17	P04 1)	KEYB4	keyboard scan line input/output
18	P05 1)	KEYB5	keyboard scan line input/output
19	P06 1)	KEYB6	keyboard scan line input/output
20	P07	MDSTR	system mode strobe output
21	Vss		ground supply input
22	VOW1/DP16	RED	OSD red output
23	VOW2/DP15	GREEN	OSD green output
24	VOW3	BLUE	OSD blue output
25	VOB	FBL	OSD fast blanking output
26	HSYNCN	HSYNC	horizontal synchronization input
27	VSYNCN	VSYNC	vertical synchronization input
28	DOSC		RC oscillator input for OSD
29	T1	IDENT	horizontal coincidence input
30	TEST		test input; connected to ground
31	XTAL1		oscillator input; 10 MHz crystal
32	XTAL2		oscillator output
33	RESETN		power-on reset input/output
34	DP14	SNDI	dual/non dual language sound input
35	INTN/T0	RMOT	remote control input
36	DP13 1)	SNDO	sound mode select output Language 1/2 control output Stereo/mono control output
37	DP12 1)	EFFECT	Sound effect control output
38	DP11 1)	SYSTEM	PAL/SECAM system standard control output SECAM-L/L' depends on VHF-L output PAL/NTSC system standard control output
39	DP07/SCL	SCL	I^2C-bus clock signal input/output
40	DP06/SDA	SDA	I^2C-bus data signal input/output
41	DP10	STDBY	Standby/On control input/output
42	Vdd		+5V supply voltage input

Note:

1) These pins are read at "cold start", they define the configuration/options of the TV-system controlled by CTV320S.
2) These pins can command a solenoid to switch-off AC-mains supply.

TDA4601 (IC801)

The integrated circuit TDA4601 or-D is designed for regulating controlling and protecting the switching transistor installed in the flyback converter power supplies. It also protects the complete SMPS by preventing an increase in the secondary voltage in case of errors. In addition to their use with TV receivers and video recorders, these ICs can be applied in power supplies of Hi-Fi sets and active speakers due to their wide operational ranges and supperior voltage stability during high load change.

1. Features

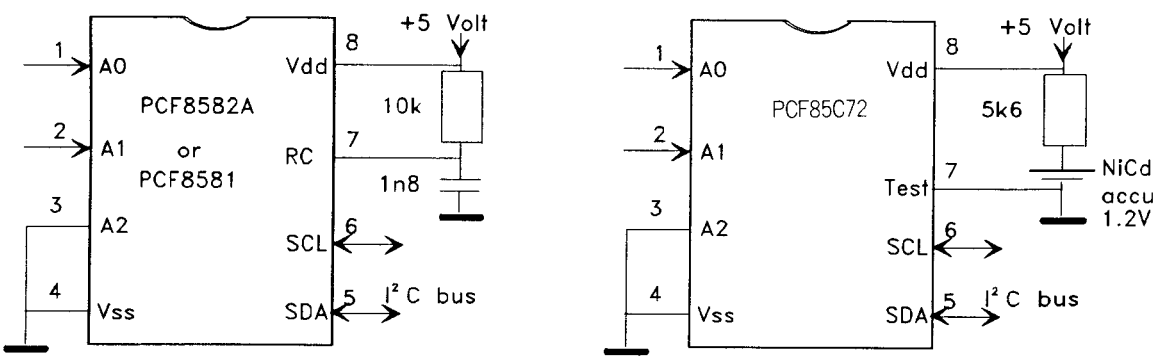
- Direct control of switching transistor
- Low start-up current
- Reversing linear overload characteristic
- Collector current proportional to base-current input
- Protective circuit in the event of errors.

2. Pin description

Pin No	Function
1	Vref output
2	Zero-passage identification
3	Input regulating amplifier,overload amplifier
4	Collector-current simulation
5	Possible connection for additional RLD0protective circuit
6	Ground (rigidly connected to substrate RLD0mounting plate)
7	DC voltage output for charging the RLD0coupling capacitor
8	Pulse output, driving the switching RLD0transistor
9	Power supply

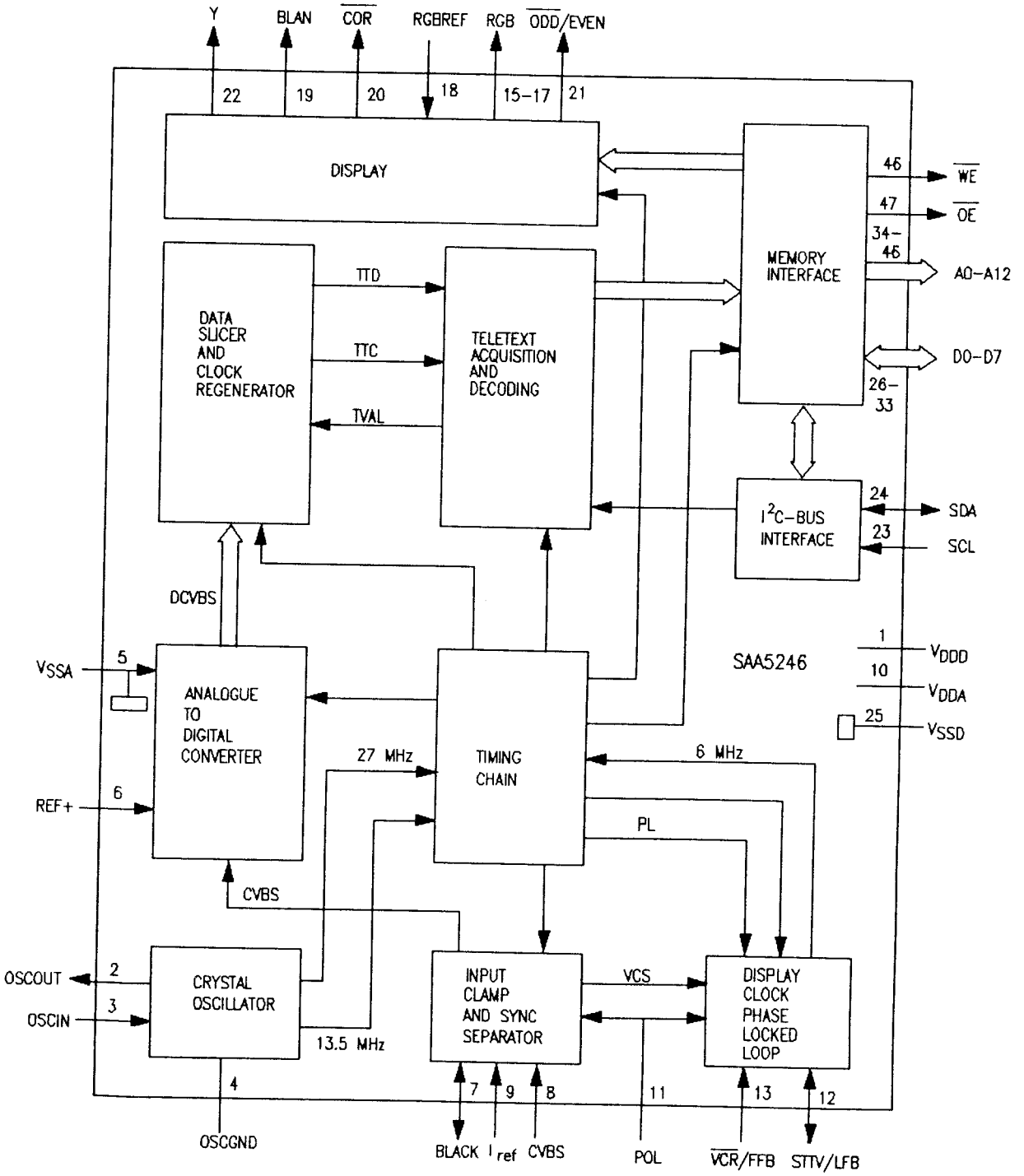
NON-VOLATILE MEMORY

The CTV320s tuning and sound system requires 128 bytes non-volatile memory (EEPROM PCF8581A or CMOS PCF2). With such a memory the system is able to store up 40 "pre-selected" programs, the video and sound control values (option 9a). The number of programs can be extended to 90 (option 9b) by using a 256 bytes memory (EEPROM PCF8582A or CMOS PCF8570).

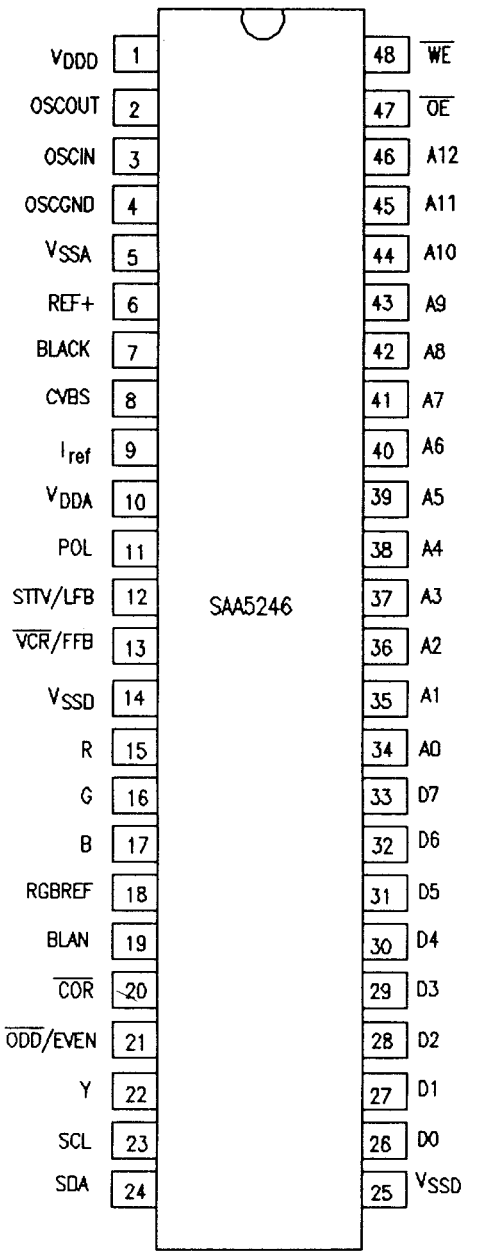


Application of CMOS and EEPROM non-volatile memory in CTV320S.

SAA5246 BLOCK DIAGRAM



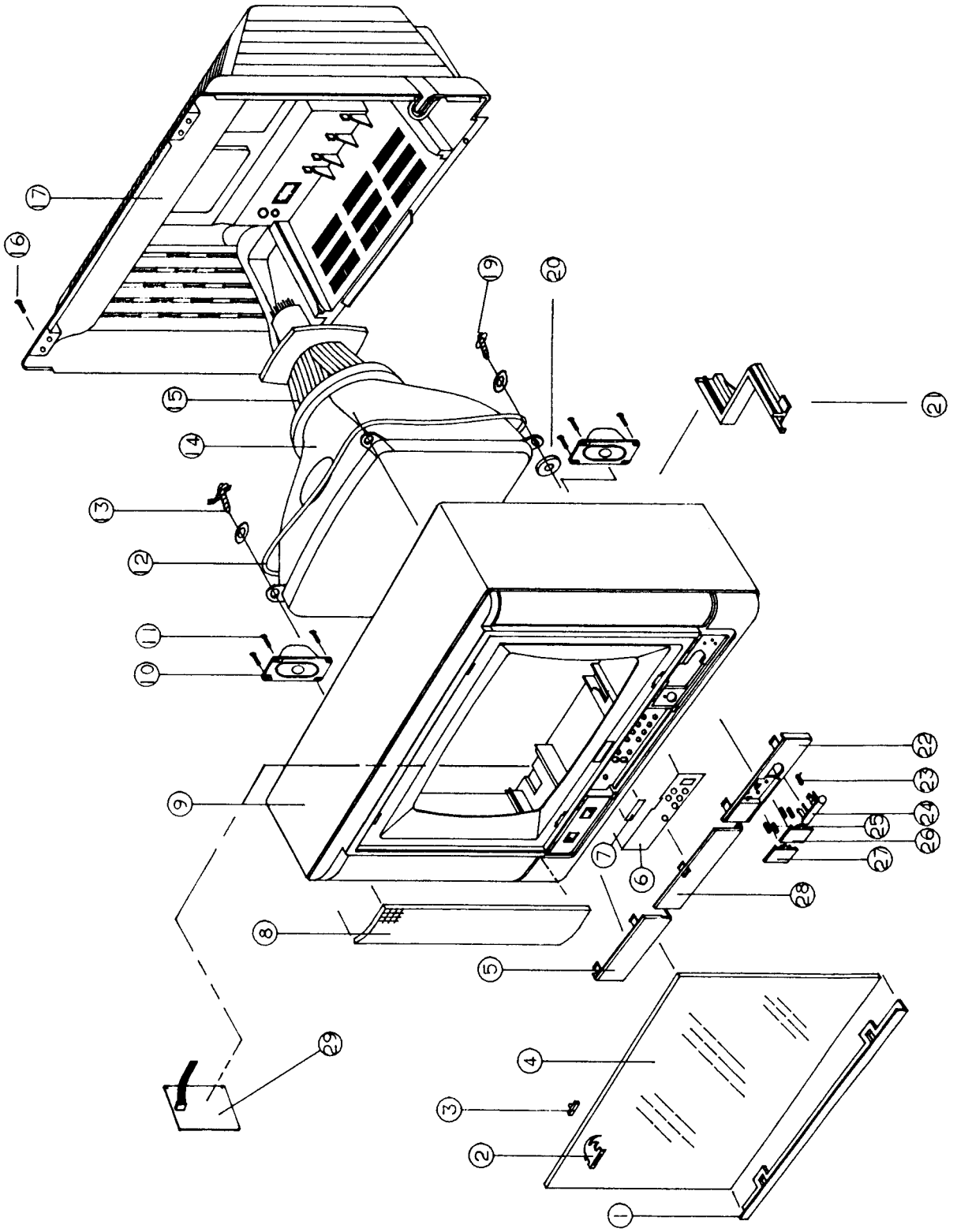
SAA5246 PIN DIAGRAM



PIN DESCRIPTION

pin	mnemonic	description
1	V_{DDD}	+5 V supply to the digital sections of the device.
2	OSCOUT	27 MHz crystal oscillator output.
3	OSCIN	27 MHz crystal oscillator input.
4	OSCGND	Crystal oscillator ground 0 V.
5	V_{SSA}	Analogue ground 0 V.
6	REF+	Positive reference voltage for the ADC. If necessary, the pin should be connected to analogue +5 V via decoupling components.
7	BLACK	Video black level storage pin, connected to analogue ground via a 100 nF capacitor.
8	CVBS	Composite video input pin. A positive-going 1 V peak-to-peak input is required, connected via a 100 nF capacitor.
9	I_{ref}	Reference current input pin, connected to analogue ground via a 27 kΩ resistor.
10	V_{DDA}	+ 5 V supply to the analogue sections of the device.
11	POL	STTV/LFB/FFB polarity select pin.
12	STTV/LFB	Sync to TV output pin/line flyback input pin. Function controlled by an internal register bit.
13	$\overline{VCR}$/FFB	PLL time constant switch/field flyback input pin. Function controlled by an internal register bit.
14	V_{SSD}	Connected to VSSD for normal operation.
15	R	Dot rate charater output of the RED colour information.
16	G	Dot rate character output of the GREEN colour information.
17	B	Dot rate character output of the BLUE colour information.
18	RGBREF	DC voltage to define the output high level on the RGB pins.
19	BLAN	Dot rate fast blanking output. HIGH for text and LOW for picture.
20	$\overline{COR}$	Programmable output to provide contrast reduction of the TV picture for mixed text and picture displays or when viewing newsflash/subtitle pages. Open drain output.
21	$\overline{ODD}$/EVEN	25 Hz output synchronized with the CVBS input's field sync pulses to produce a non-interlaced display by adjustment of the vertical deflection currents.
22	Y	Dot rate chracter output of teletext foreground colour information. Open drain output.
23	SCL	Serial clock input for I2C-bus. It can still be driven HIGH during power-down of the device.
24	SDA	Serial data port for the I2C-bus. Open drain output. It can still be driven HIGH during power-down of the device.
25	V_{SSD}	Digital groud 0 V.
26-33	D0-D7	Data lines for the page RAM.
34-46	A0-A12	Address lines for the page RAM.
47	$\overline{OE}$	Output enable to the page RAM.
48	$\overline{WE}$	Write enable to the page RAM.

EXPLODED VIEW(CK5027T)



PARTS LIST (CK5027T/WELTX)

The items with "*" are usually out of stock since they are seldom required for the routine service. There may be some anticipated delay when you order these items. *** S.N.A = SERVICE NOT AVAILABLE. ***

NO	CODE NO	DESCRIPTION	SPECIFICATION	Q'TY
1	36603-117-110	HOLDER-GLASS	PVC VO BLK(SILVER)	1
2	36604-133-110	HOLDER-SCREEN	ABS HB BLK	2
3	38714-105-310	RUBBER-GLASS,BOT	NEOPRENE BLK	2
4	38333-104-311	SUN-SCREEN	SAFETY GLASS T3.2	1
5	37613-115-250	DECORATION	PC GE 21051	1
6	38093-109-010	PVC-CONTROL	ART-PAPER 90(S)	1
7	37714-313-410	INLAY-BRAND	A1050P-H18 T0.5	1
8	37712-113-810	GRILLE-WOOFER	SPC-1 T0.5 #677	2
9	36000-146-010	CABINET-FRONT	HIPS HB BLK #677+#066	1
10	34209-169-190	SPEAKER-GENERAL	5902BR 3W	2
11	37148-530-101	SCREW-TAP,RH	2S-3X10 FE FZY	8
12	32479-029-210	COIL-DEGAUSSING	9.3RT25L2300	1
13	37124-100-611	SCREW-CRT,ASSY	6X30 PH+W/S	2
14	32019-400-015	CRT-COLOR	51GGB91X	1
15	32439-090-010	DEFL-YOKE	DIE-1992GL	1
16	37148-540-152	SCREW-TAP,RH	2S-4X15 FE FZY	6
17	36000-147-010	CABINET-BACK	HIPS HB BLK	1
19	37108-106-301	SCREW-CRT	PH+1-6X30 FE FZY	2
20	36834-112-910	WASHER-GUM,CRT	NEOPRENE RUBBER HB BLK T3.0	4
21	36022-108-210	RAIL-PCB	ABS VO NTR	1
22	37622-104-630	KNOB-BASE	PC GE 21051	1
23	36674-140-840	SPRING-COIL	SUS MASTER	1
24	37624-623-410	KNOB-MASTER	PC GE 21051	1
25	36674-140-860	SPRING-COIL	SUS CT-1492 CH, VOL	4
26	37624-624-030	KNOB-SEESAW	PC GE 21051 VOLUME,NEW	1
27	37624-624-040	KNOB-SEESAW	PC GE 21051 S/P,NEW	1
28	37643-150-610	DOOR	PC GE 21051	1
29	33004-145-251	PWB-TTX (S.N.A)	10X130X1.6T	1

CHASSIS REPLACEMENT PARTS LIST

ABBREVIATIONS:

CC	C-CERAMIC	RC	R-COMPOSITION
CE	C-ELECTROLYTIC	RD	R-CARBON
CFS	C-M,POLYESTER	RF	R-FUSIBLE
CK	C-CERAMIC,HK	RM	R-METAL,FILM
CQ	C-POLYPROPYLENE,POLYESTER	RP	R-CEMENT WIRE
CS	C-TANTALIUM,SOLID	RS	R-METAL,OXIDE

NOTE: The items with "*" are usually out of stock since they are seldom required for the routine service. There may be some anticipated delay when you order these items.

*** S.N.A.=Service Not Available.***

Loc No	Supplier Part No.	Description	
	1 . P W B - M A I N		
PWB	33004-145-651	330X245X1.6T	(S.N.A)
	RESISTORS		
NR001	31046-467-221	RS 1T 220-J (AUTO)	
NR002	31018-377-152	RD 1/2T 1.5K-J	
R101	31018-177-120	RD 1/8T 12-J	
R102	31018-177-470	RD 1/8T 47-J	
R103	31018-177-122	RD 1/8T 1.2K-J	
R104	31018-177-472	RD 1/8T 4.7K-J	
R105	31018-177-101	RD 1/8T 100-J	
R107	31018-177-100	RD 1/8T 10-J	
R108	31018-177-122	RD 1/8T 1.2K-J	
R110	31018-177-472	RD 1/8T 4.7K-J	
R111	31018-177-223	RD 1/8T 22K-J	
R112	31018-177-182	RD 1/8T 1.8K-J	
R113	31018-177-332	RD 1/8T 3.3K-J	
R114	31018-177-224	RD 1/8T 220K-J	
R115	31018-177-224	RD 1/8T 220K-J	
R116	31018-177-124	RD 1/8T 120K-J	
R118	31018-177-101	RD 1/8T 100-J	
R121	31018-177-159	RD 1/8T 1.5-J	
R122	31018-177-472	RD 1/8T 4.7K-J	
R123	31018-177-472	RD 1/8T 4.7K-J	
R124	31018-177-333	RD 1/8T 33K-J	
R202	31018-177-221	RD 1/8T 220-J	
R204	31018-177-202	RD 1/8T 2K-J	
R205	31018-177-102	RD 1/8T 1K-J	
R206	31018-177-750	RD 1/8T 75-J	
R207	31018-177-910	RD 1/8T 91-J	
R208	31018-177-222	RD 1/8T 2.2K-J	
R209	31048-175-102	RM 1/8T 1K-F	
R210	31047-351-273	RM 1/2T 127K-F	
R302	31048-175-474	RM 1/8T 470K-F	
R303	31018-177-332	RD 1/8T 3.3K-J	
R304	31018-377-681	RD 1/2T 680-J	
R305	31018-177-203	RD 1/8T 20K-J	
R306	31018-377-159	RP 1/2T 1.5R-J	
R307	31018-177-333	RD 1/8T 33K-J	
R308	31018-177-183	RD 1/8T 18K-J	
R309	31018-377-271	RD 1/2T 270-J	
R310	31018-177-153	RD 1/8T 15K-J	
R311	31018-177-224	RD 1/8T 220K-J	
R312	31018-177-222	RD 1/8T 2.2K-J	
R401	31018-177-154	RD 1/8T 150K-J	
R402	31048-176-303	RM 1/8T 30K-G	
R403	31018-177-182	RD 1/8T 1.8K-J	
R404	31018-177-824	RD 1/8T 820K-J	
R405	31018-177-272	RD 1/8T 2.7K-J	
R406	31018-177-220	RD 1/8T 22-J	
R407	31018-177-224	RD 1/8T 220K-J	
R408	31018-177-333	RD 1/8T 33K-J	
R409	31018-177-753	RD 1/8T 75K-J	
R410	31018-177-271	RD 1/8T 270-J	
R411	31018-377-680	RD 1/2T 68-J	
R412	31059-002-010	RF 1/2P 1-J	
R414	31046-467-151	RS 1T 150-J (AUTO)	
R415	31046-467-102	RS 1T 1K-J (AUTO)	
R416	31018-177-683	RD 1/8T 68K-J	
R417	31018-177-563	RD 1/8T 56K-J	
R501	31018-177-512	RD 1/8T 5.1K-J	
R502	31018-177-152	RD 1/8T 1.5K-J	
R503	31018-177-102	RD 1/8T 1K-J	
R504	31018-177-751	RD 1/8T 750-J	
R505	31018-177-471	RD 1/8T 470-J	
R506	31018-177-103	RD 1/8T 10K-J	
R507	31018-177-102	RD 1/8T 1K-J	

Loc No	Supplier Part No.	Description
R508	31018-177-561	RD 1/8T 560-J
R509	31018-177-112	RD 1/8T 1.1K-J
R510	31018-177-750	RD 1/8T 75-J
R511	31018-177-750	RD 1/8T 75-J
R512	31018-177-750	RD 1/8T 75-J
R513	31018-177-750	RD 1/8T 75-J
R514	31018-177-750	RD 1/8T 75-J
R515	31018-177-750	RD 1/8T 75-J
R517	31018-177-111	RD 1/8T 110-J
R518	31018-177-821	RD 1/8T 820-J
R519	31018-177-750	RD 1/8T 75-J
R520	31018-177-124	RD 1/8T 120K-J
R521	31018-177-561	RD 1/8T 560-J
R522	31018-177-242	RD 1/8T 2.4K-J
R523	31018-177-911	RD 1/8T 910-J
R524	31018-177-511	RD 1/8T 510-J
R527	31018-177-620	RD 1/8T 62-J
R601	31018-177-750	RD 1/8T 75-J
R602	31018-177-681	RD 1/8T 680-J
R603	31018-177-472	RD 1/8T 4.7K-J
R604	31018-177-132	RD 1/8T 1.3K-J
R605	31018-177-182	RD 1/8T 1.8K-J
R606	31018-177-121	RD 1/8T 120-J
R607	31018-177-102	RD 1/8T 1K-J
R608	31018-177-202	RD 1/8T 2K-J
R609	31018-177-103	RD 1/8T 10K-J
R610	31018-177-750	RD 1/8T 75-J
R611	31018-177-750	RD 1/8T 75-J
R612	31018-177-103	RD 1/8T 10K-J
R613	31018-177-103	RD 1/8T 10K-J
R614	31018-177-752	RD 1/8T 7.5K-J
R615	31018-177-822	RD 1/8T 8.2K-J
R616	31018-177-104	RD 1/8T 100K-J
R617	31018-177-224	RD 1/8T 220K-J
R618	31018-177-562	RD 1/8T 5.6K-J
R619	31018-177-203	RD 1/8T 20K-J
R620	31046-567-339	RS 2T 3.3-J(AUTO)
R621	31018-377-479	RD 1/2T 4.7-J
R622	31018-177-202	RD 1/8T 2K-J
R623	31018-177-103	RD 1/8T 10K-J
R625	31018-177-103	RD 1/8T 10K-J
R626	31018-177-103	RD 1/8T 10K-J
R627	31018-177-222	RD 1/8T 2.2K-J
R701	31018-177-333	RD 1/8T 33K-J
R702	31018-177-333	RD 1/8T 33K-J
R704	31018-177-104	RD 1/8T 100K-J
R705	31018-177-124	RD 1/8T 120K-J
R708	31018-177-203	RD 1/8T 20K-J
R709	31018-177-273	RD 1/8T 27K-J
R720	31018-177-104	RD 1/8T 100K-J
R801	31039-687-569	RW 7H 5.6-J
R802	31049-317-104	RS 3P 2.7K-J
R803	31046-567-154	RS 2T 150K-J(AUTO)
R804	31018-177-221	RD 1/8T 220-J
R805	31018-177-122	RD 1/8T 1.2K-J
R806	31018-177-103	RD 1/8T 10K-J
R807	31018-177-113	RD 1/8T 11K-J
R808	31046-567-101	RS 2T 100-J(AUTO)
R809	31046-467-274	RS 1T 270K-J (AUTO)
R811	31018-177-104	RD 1/8T 100K-J
R812	31018-377-688	RD 1/2T 0.68-J
R813	31018-177-101	RD 1/8T 100-J
R814	31039-586-390	RW 5J 39-J
R815	31028-328-475	RC 1/2P 4.7M-K
R821	31046-567-333	RS 2T 33K-J(AUTO)
R822	31046-567-153	RS 2T 15K-J(AUTO)
R823	31046-567-220	RS 2T 22-J(AUTO)
R824	31046-567-101	RS 2T 100-J(AUTO)
R825	31059-002-130	RF 1/2P 0.47-K
R829	31059-002-130	RF 1/2P 0.47-K
R830	31046-567-121	RS 2T 120-J(AUTO)
R901	31018-177-221	RD 1/8T 220-J
R902	31018-177-221	RD 1/8T 220-J
R903	31018-177-221	RD 1/8T 220-J
R904	31018-177-102	RD 1/8T 1K-J
R905	31018-177-102	RD 1/8T 1K-J
R906	31018-177-102	RD 1/8T 1K-J
R907	31018-177-242	RD 1/8T 2.4K-J
R908	31018-177-102	RD 1/8T 1K-J
R909	31018-377-151	RD 1/2T 150-J
R910	31018-177-301	RD 1/8T 300-J
R911	31018-377-680	RD 1/2T 68-J
R912	31018-377-823	RD 1/2T 82K-J
R913	31018-377-823	RD 1/2T 82K-J
R914	31018-377-823	RD 1/2T 82K-J
R915	31046-567-153	RS 2T 15K-J(AUTO)
R916	31046-567-153	RS 2T 15K-J(AUTO)
R917	31046-567-153	RS 2T 15K-J(AUTO)
R918	31028-328-472	RC 1/2T 4.7K-K
R919	31028-328-472	RC 1/2T 4.7K-K
R920	31028-328-472	RC 1/2T 4.7K-K
R921	31059-003-100	RF 1P 1-K
RR01	31018-177-332	RD 1/8T 3.3K-J
RR03	31018-177-683	RD 1/8T 68K-J
RR04	31018-177-153	RD 1/8T 15K-J
RR05	31018-177-103	RD 1/8T 10K-J
RR06	31018-177-103	RD 1/8T 10K-J
RR07	31018-177-472	RD 1/8T 4.7K-J

Loc No	Supplier Part No.	Description
RR08	31018-177-681	RD 1/8T 680-J
RR10	31018-177-102	RD 1/8T 1K-J
RR11	31018-177-202	RD 1/8T 2K-J
RR12	31018-177-512	RD 1/8T 5.1K-J
RR14	31018-177-511	RD 1/8T 510-J
RR15	31018-177-132	RD 1/8T 1.3K-J
RR16	31018-177-471	RD 1/8T 470-J
RR17	31018-177-102	RD 1/8T 1K-J
RR18	31018-177-202	RD 1/8T 2K-J
RR19	31018-177-302	RD 1/8T 3K-J
RR20	31018-177-333	RD 1/8T 33K-J
RR21	31018-177-562	RD 1/8T 5.6K-J
RR22	31018-177-562	RD 1/8T 5.6K-J
RR23	31018-177-333	RD 1/8T 33K-J
RR24	31018-177-562	RD 1/8T 5.6K-J
RR25	31018-177-562	RD 1/8T 5.6K-J
RR26	31018-177-124	RD 1/8T 120K-J
RR28	31018-177-333	RD 1/8T 33K-J
RR29	31018-177-562	RD 1/8T 5.6K-J
RR30	31018-177-562	RD 1/8T 5.6K-J
RR31	31018-177-333	RD 1/8T 33K-J
RR32	31018-177-222	RD 1/8T 2.2K-J
RR33	31018-177-681	RD 1/8T 680-J
RR34	31018-177-681	RD 1/8T 680-J
RR35	31018-177-681	RD 1/8T 680-J
RR36	31018-177-471	RD 1/8T 470-J
RR37	31018-177-181	RD 1/8T 180-J
RR38	31018-177-222	RD 1/8T 2.2K-J
RR39	31018-177-223	RD 1/8T 22K-J
RR40	31018-177-181	RD 1/8T 180-J
RR41	31018-177-431	RD 1/8T 430-J
RR42	31018-177-181	RD 1/8T 180-J
RR43	31018-177-102	RD 1/8T 1K-J
RR44	31018-177-272	RD 1/8T 2.7K-J
RR45	31018-177-101	RD 1/8T 100-J
RR46	31018-177-101	RD 1/8T 100-J
RR47	31018-177-101	RD 1/8T 100-J
RR48	31018-177-101	RD 1/8T 100-J
RR49	31018-177-103	RD 1/8T 10K-J
RR50	31018-177-272	RD 1/8T 2.7K-J
RR51	31046-567-271	RS 2T 270-J(AUTO)
RR52	31018-177-101	RD 1/8T 100-J
RR53	31018-177-332	RD 1/8T 3.3K-J
RR54	31018-177-332	RD 1/8T 3.3K-J
RR55	31018-177-222	RD 1/8T 2.2K-J
RR56	31018-177-223	RD 1/8T 22K-J
RR57	31018-177-221	RD 1/8T 220-J
RR58	31018-177-470	RD 1/8T 47-J
RR59	31018-177-223	RD 1/8T 22K-J
RR61	31018-177-101	RD 1/8T 100-J
RR62	31018-177-103	RD 1/8T 10K-J
RS01	31018-177-473	RD 1/8T 47K-J
RS02	31018-177-622	RD 1/8T 6.2K-J
RS03	31018-177-132	RD 1/8T 1.3K-J
RS04	31018-177-102	RD 1/8T 1K-J
RS05	31018-177-331	RD 1/8T 330-J
RS06	31018-177-221	RD 1/8T 220-J
RS07	31018-177-162	RD 1/8T 1.6K-J
RS08	31018-177-563	RD 1/8T 56K-J
RS11	31018-177-112	RD 1/8T 1.1K-J
RS12	31018-177-391	RD 1/8T 390-J
RS13	31018-177-911	RD 1/8T 910-J
RS14	31018-177-159	RD 1/8T 1.5-J
RS15	31018-177-202	RD 1/8T 2K-J
RS16	31018-177-122	RD 1/8T 1.2K-J
RS17	31018-177-202	RD 1/8T 2K-J
SR02	31018-177-103	RD 1/8T 10K-J
		VARIABLE RESISTORS
VR101	31249-128-002	EVN-DJA A03 B20K
VR201	31249-128-011	EVN-DJA A03 B500
VR301	31249-128-004	EVN-DJA A03 B1K
VR303	31249-128-005	EVN-DJA A03 B5K
VR401	31249-128-001	EVN-DJA A03 B10K
VR402	31249-128-008	EVN-DJA A03 B50K
VR501	31249-128-003	EVN-DJA A03 B2K
VR801	31249-128-005	EVN-DJA A03 B5K
VR901	31249-128-004	EVN-DJA A03 B1K
VR902	31249-128-004	EVN-DJA A03 B1K
VR903	31249-128-004	EVN-DJA A03 B1K
VR904	31249-128-005	EVN-DJA A03 B5K
VR905	31249-128-005	EVN-DJA A03 B5K
VRS01	31249-128-004	EVN-DJA A03 B1K
		CAPACITORS
C101	31407-105-180	CC45 TAPG CH 50V 220-J
C103	31417-109-140	CK45 TAPG F 50V 103-Z
C104	31407-105-280	CC45 TAPG CH 50V 560-J
C105	31417-109-140	CK45 TAPG F 50V 103-Z
C106	31417-109-140	CK45 TAPG F 50V 103-Z
C107	31607-401-500	CE04W TAPG 16V 470M-M(SG
C108	31417-109-140	CK45 TAPG F 50V 103-Z
C111	31607-402-230	CE04W TAPG 50V 3.3M
C112	31507-127-012	EVQB1H104J-F3/2E 63V 104
C113	31607-401-470	CE04W TAPG 16V 100M VENT
C116	31507-127-025	ECQ-V1H334JZ3/2E 63V 0.3

Loc No	Supplier Part No.	Description
C117	31507-127-008	ECQ B1H 223JF3
C118	31507-127-011	ECQ B1H 683JF3
C119	31607-401-500	CE04W TAPG 16V 470M-M(SG
C120	31607-902-250	CE04W TAPG 50V 0.22M
C121	31607-402-210	CE04W TAPG 50V 1M
C122	31607-402-070	CE04W TAPG 35V 22M
C123	31607-402-250	CE04W TAPG 50V 10M
C124	31607-401-470	CE04W TAPG 16V 100M VENT
C125	31507-127-024	ECQ-V1H224JZ3/2E 63V 0.2
C202	31417-109-140	CK45 TAPG F 50V 103-Z
C203	31607-402-530	CE04W TAPG 50V 0.47u-NP
C204	31607-401-470	CE04W TAPG 16V 100M VENT
C205	31607-402-530	CE04W TAPG 50V 0.47u-NP
C206	31507-127-008	ECQ B1H 223JF3
C207	31507-127-025	ECQ-V1H334JZ3/2E 63V 0.3
C208	31407-105-700	CC45 TAPG CH 50V 151-J
C209	31519-003-020	CFS922M 400V 0.1-K
C301	31519-101-110	DSR 50V 0.22U-J
C302	31507-127-003	ECQ B1H 332JF3
C303	31507-127-011	ECQ B1H 683JF3
C304	31507-127-012	EVQB1H104J-F3/2E 63V 104
C305	31609-904-332	CE04W 25V 3300u
C306	31607-402-220	CE04W TAPG 50V 2.2M
C307	31607-402-290	CE04W TAPG 50V 100M-M(SG
C308	31607-402-480	CE04W TAPG 50V 47-W(+20-
C309	31607-402-250	CE04W TAPG 50V 10M
C310	31507-127-022	ECQ B1H 513JF3
C313	31507-127-023	ECQ B1H 122JF3
C401	31519-101-100	DSR 50V 0.0027 U-J
C402	31607-402-240	CE04W TAPG 50V 4.7M
C403	31507-127-011	ECQ B1H 683JF3
C404	31417-104-270	CK45 TAPG B 50V 681-K
C407	31507-127-012	EVQB1H104J-F3/2E 63V 104
C408	31507-127-001	ECQ B1H 152JF3
C409	31507-127-006	ECQ B1H 103JF3
C410	31417-344-222	CK45 TAPG F 50V 222-Z
C411	31519-400-003	CFS 922M 1600V 0.0077-J
C414	31607-402-710	CE04W TAPG 35V 1000M-M
C416	31607-403-070	CE04W TAPG 100V 68M-M
C418	31607-403-450	CE04W TAPG 250V 1M
C419	31509-335-190	CQ922M 200V 0.43M-J
C501	31507-127-012	EVQB1H104J-F3/2E 63V 104
C502	31607-401-510	CE04W TAPG 16V 1000U-M
C503	31417-104-400	CK45 TAPG B 50V 102-K
C504	31507-127-024	ECQ-V1H224JZ3/2E 63V 0.2
C505	31507-127-008	ECQ B1H 223JF3
C506	31407-105-660	CC45 TAPG CH 50V 101-J
C507	31407-105-660	CC45 TAPG CH 50V 101-J
C510	31607-402-220	CE04W TAPG 50V 2.2M
C511	31507-127-024	ECQ-V1H224JZ3/2E 63V 0.2
C512	31607-402-240	CE04W TAPG 50V 4.7M
C513	31607-401-670	CE04W TAPG 25V 47M
C515	31507-127-012	EVQB1H104J-F3/2E 63V 104
C516	31607-402-240	CE04W TAPG 50V 4.7M
C517	31507-127-012	EVQB1H104J-F3/2E 63V 104
C518	31507-127-012	EVQB1H104J-F3/2E 63V 104
C519	31507-127-012	EVQB1H104J-F3/2E 63V 104
C520	31507-127-012	EVQB1H104J-F3/2E 63V 104
C521	31507-127-012	EVQB1H104J-F3/2E 63V 104
C522	31507-127-012	EVQB1H104J-F3/2E 63V 104
C523	31607-402-210	CE04W TAPG 50V 1M
C524	31607-402-210	CE04W TAPG 50V 1M
C525	31607-402-550	CE04W 50V 6.8U-M
C526	31417-109-140	CK45 TAPG F 50V 103-Z
C601	31407-105-260	CC45 TAPG CH 50V 470-J
C603	31417-109-220	CK45 TAPG F 50V 223-Z
C604	31607-401-460	CE04W TAPG 16V 47M
C605	31417-109-220	CK45 TAPG F 50V 223-Z
C606	31507-127-008	ECQ B1H 223JF3
C607	31507-127-010	ECQ B1H 473JF3
C608	31607-402-210	CE04W TAPG 50V 1M
C609	31607-402-530	CE04W TAPG 50V 0.47u-NP
C610	31607-402-530	CE04W TAPG 50V 0.47u-NP
C611	31607-401-470	CE04W TAPG 16V 100M VENT
C612	31607-402-210	CE04W TAPG 50V 1M
C613	31507-127-012	EVQB1H104J-F3/2E 63V 104
C614	31507-127-002	ECQ B1H 222JF3
C615	31507-127-016	ECQ B1H 472JF3
C616	31607-402-070	CE04W TAPG 35V 22M
C617	31607-401-770	CE04W TAPG 25V 2200M-M(S
C618	31507-127-006	ECQ B1H 103JF3
C620	31607-402-110	CE04W TAPG 35V 220M-M
C621	31507-127-002	ECQ B1H 222JF3
C623	31607-402-250	CE04W TAPG 50V 10M
C701	31417-109-140	CK45 TAPG F 50V 103-Z
C801	31569-204-190	250V 0.47M/KNB 1530
C802	31569-204-190	250V 0.47M/KNB 1530
C803	31467-502-220	CK45P TAPG E250V 222-Z(1
C804	31467-502-220	CK45P TAPG E250V 222-Z(1
C805	31467-502-220	CK45P TAPG E250V 222-Z(1
C806	31467-502-220	CK45P TAPG E250V 222-Z(1
C807	31609-403-780	CE04W 400V 100M-M(LIG)
C808	31607-401-470	CE04W TAPG 16V 100M VENT
C809	31407-106-760	CC45 TAPG RH 50V 151-J
C810	31509-332-000	CQ922M 100V 0.0082-J
C811	31607-402-250	CE04W TAPG 50V 10M
C812	31507-127-004	ECQ B1H 562JF3
C813	31607-401-470	CE04W TAPG 16V 100M VENT

Loc No	Supplier Part No.	Description
C814	31509-391-090	CQ922M 1600V 0.0022-J
C816	31417-901-660	CK45 TAPG B1KV 222-K
C817	31607-401-680	CE04W TAPG 25V 100U
C818	31469-504-060	ECK-DNS472MEX/E400V 472(
C823	31417-767-331	CK45 TAPG B2KV 331-K
C824	31609-403-140	CE04W 160V 220U-M
C825	31607-401-720	CE04W TAPG 25V 1000M-M
C826	31607-402-250	CE04W TAPG 50V 10M
C827	31417-767-331	CK45 TAPG B2KV 331-K
C828	31607-401-770	CE04W TAPG 25V 2200M-M(S
C829	31607-401-510	CE04W TAPG 16V 1000U-M
C833	31417-767-331	CK45 TAPG B2KV 331-K
C834	31607-402-110	CE04W TAPG 35V 220M-M
C901	31407-105-300	CC45 TAPG CH 50V 680-J
C902	31407-047-121	CC45 TAPG RH 50V 121-J
C903	31407-105-280	CC45 TAPG CH 50V 560-J
C904	31607-403-450	CE04W TAPG 250V 1M
C905	31417-767-102	CK45 TAPG B2KV 102-K
C907	31417-104-250	CK45 TAPG B 50V 471-K
C908	31417-104-250	CK45 TAPG B 50V 471-K
C909	31417-104-250	CK45 TAPG B 50V 471-K
CS01	31607-402-210	CE04W TAPG 50V 1M
CS02	31407-047-220	CC45 TAPG RH 50V 220-J
CS03	31407-106-630	CC45 TAPG RH 50V 470-K
CS04	31507-127-012	EVQB1H104J-F3/2E 63V 104
CS05	31407-105-180	CC45 TAPG CH 50V 220-J
CS06	31507-127-012	EVQB1H104J-F3/2E 63V 104
CS07	31607-402-220	CE04W TAPG 50V 2.2M
CS08	31507-127-012	EVQB1H104J-F3/2E 63V 104
CS09	31407-106-260	CC45 TAPG RH 50V 101-J
CS10	31407-047-271	CC45 TAPG RH 50V 271-J
CS11	31507-127-012	EVQB1H104J-F3/2E 63V 104
CS12	31407-047-221	CC45 TAPG RH 50V 221-J
CS13	31407-047-221	CC45 TAPG RH 50V 221-J
CS14	31507-127-012	EVQB1H104J-F3/2E 63V 104
CS15	31607-401-470	CE04W TAPG 16V 100M VENT
CS16	31607-402-210	CE04W TAPG 50V 1M
CS17	31407-057-330	CC45 TAPG CH 50V 330-J
CS18	31407-106-230	CC45 TAPG RH 50V 300-J
CS19	31417-104-250	CK45 TAPG B 50V 471-K
CS20	31507-127-024	ECQ-V1H224JZ3/2E 63V 0.2
CS21	31507-127-024	ECQ-V1H224JZ3/2E 63V 0.2
CS22	31407-047-221	CC45 TAPG RH 50V 221-J
CS23	31407-048-820	CC45 TAPG RH 50V 820-K
CS24	31407-105-280	CC45 TAPG CH 50V 560-J
CV01	31829-105-610	TZ03P 450E
NC001	31607-401-700	CE04W TAPG 25V 330M-M(SG
NC002	31607-401-520	CE04W TAPG 16V 68M-M
R832	31607-401-500	CE04W TAPG 16V 470M-M(SG

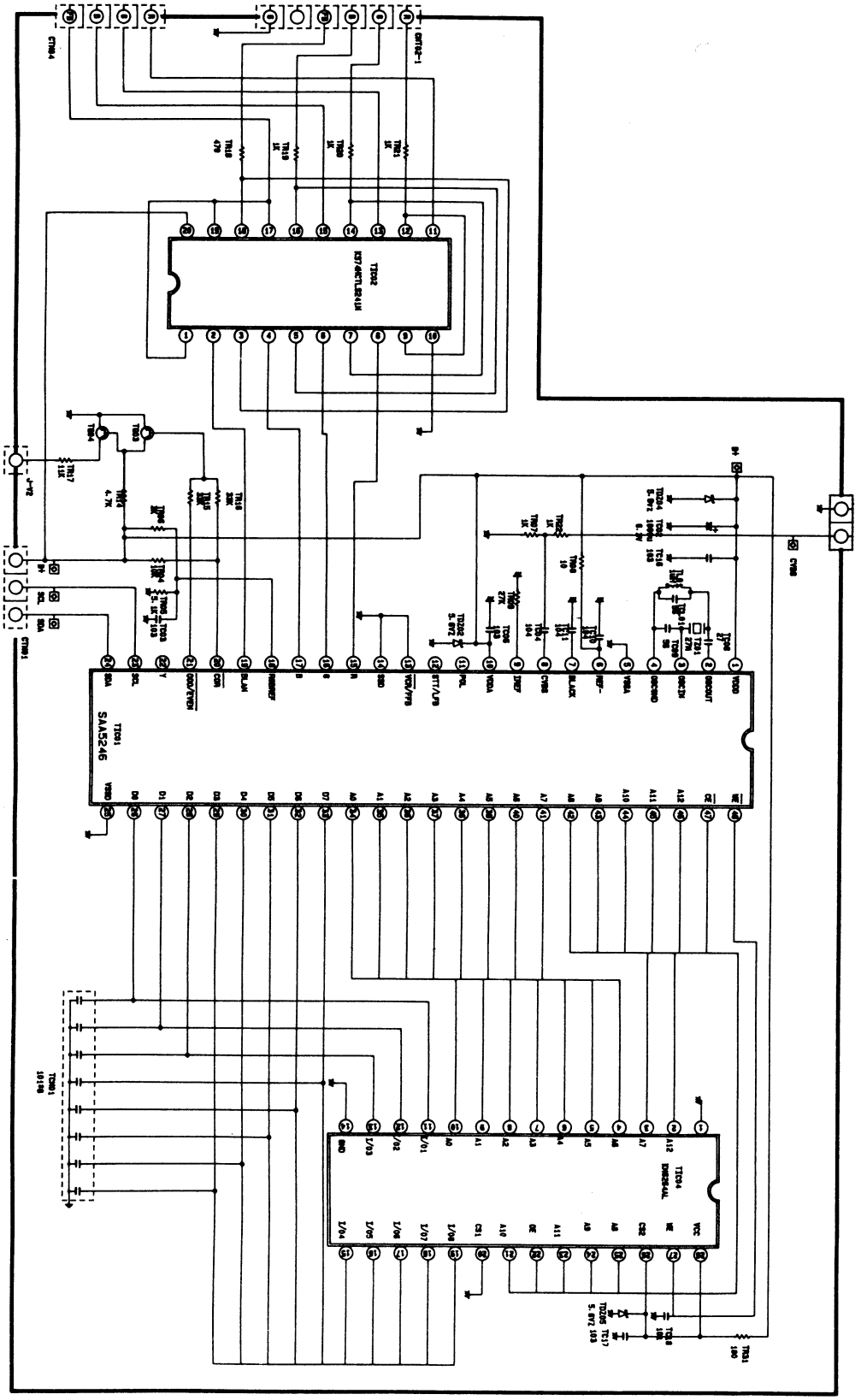
Loc No	Supplier Part No.	Description
RC01	31507-127-000	ECQ B1H 102JF3
RC02	31507-127-025	ECQ-V1H334JZ3/2E 63V 0.3
RC03	31507-127-025	ECQ-V1H334JZ3/2E 63V 0.3
RC04	31417-109-140	CK45 TAPG F 50V 103-Z
RC05	31607-402-200	CE04W TAPG 50V 0.47M
RC06	31607-402-200	CE04W TAPG 50V 0.47M
RC07	31607-402-240	CE04W TAPG 50V 4.7M
RC08	31507-127-012	EVQB1H104J-F3/2E 63V 104
RC09	31407-105-280	CC45 TAPG CH 50V 560-J
RC10	31607-401-450	CE04W TAPG 16V 33M
RC11	31507-127-000	ECQ B1H 102JF3
RC12	31607-401-470	CE04W TAPG 16V 100M VENT
RC13	31507-127-012	EVQB1H104J-F3/2E 63V 104
RC14	31607-402-250	CE04W TAPG 50V 10M
RC15	31607-401-470	CE04W TAPG 16V 100M VENT
RC16	31607-401-470	CE04W TAPG 16V 100M VENT
RC17	31507-127-002	ECQ B1H 222JF3
RC20	31407-048-820	CC45 TAPG RH 50V 820-K
RC22	31417-109-140	CK45 TAPG F 50V 103-Z
SC03	31509-452-410	CQ09S 50V 270P-J
	SEMICONDUCTORS	
D201	32167-201-070	1N4003 TAPG
D302	32167-201-170	TVR10G(TAPG)
D401	32167-201-160	TVR06G(TAPG)
D402	32167-201-160	TVR06G(TAPG)
D404	32167-201-070	1N4003 TAPG
D501	32167-406-480	1N4148 TAPG
D502	32167-101-130	1K34A (TAPG)
D503	32167-406-480	1N4148 TAPG
D506	32167-406-480	1N4148 TAPG
D507	32167-406-480	1N4148 TAPG
D508	32167-406-480	1N4148 TAPG
D601	32167-406-480	1N4148 TAPG
D701	32167-406-480	1N4148 TAPG
D702	32167-406-480	1N4148 TAPG
D703	32167-406-480	1N4148 TAPG
D704	32167-406-480	1N4148 TAPG
D705	32167-406-480	1N4148 TAPG
D706	32167-406-480	1N4148 TAPG
D707	32167-406-480	1N4148 TAPG
D801	32167-201-180	M100J(TAPG)
D802	32167-201-180	M100J(TAPG)
D803	32167-201-180	M100J(TAPG)
D804	32167-201-180	M100J(TAPG)
D805	32167-208-550	ERC24-06/RU2
D806	32167-208-550	ERC24-06/RU2
D807	32167-406-480	1N4148 TAPG

Loc No	Supplier Part No.	Description
D808	32167-208-550	ERC24-06/RU2
D809	32167-208-550	ERC24-06/RU2
D821	32167-208-550	ERC24-06/RU2
D822	32167-208-550	ERC24-06/RU2
D823	32167-208-550	ERC24-06/RU2
DS01	32167-101-130	1K34A (TAPG)
DS02	32167-406-480	1N4148 TAPG
DZ807	32167-408-080	EQA02-06D/MTZ6.2B(TAPG)
DZ824	32119-103-060	UPC574J
IC101	32119-102-250	TDA8305
IC201	32119-110-000	KA2186
IC301	32119-102-300	KA 2131
IC501	32119-103-360	TDA3561A/N8
IC601	32109-301-900	CD4066BCN
IC602	32119-201-070	TDA1013A/N4
IC801	32119-401-010	TDA4601
IC802	32119-901-110	MC7812C (AUTO)
IC803	32117-401-110	MC7805C (AUTO)
ICS502	32119-501-080	TDA3590A/N3
LD01	32309-110-230	DS2 (DL-ILR)/SL-5R
P801	32189-605-500	PTH45 A102BG180N270
P802	32189-102-030	P2462-J29/J29-P190-A20
PA01	32199-411-002	SR-5CP/RC-37V3
Q101	32137-301-090	2SC388ATM(TAPG)
Q201	32137-301-720	KSC 815-Y (TAPG)
Q401	32137-301-560	KSC 2331-Y(TAPG)
Q402	32159-210-003	2SD1651YD
Q601	32137-301-720	KSC 815-Y (TAPG)
Q602	32137-301-720	KSC 815-Y (TAPG)
Q603	32137-301-720	KSC 815-Y (TAPG)
Q701	32137-301-720	KSC 815-Y (TAPG)
Q702	32137-301-720	KSC 815-Y (TAPG)
Q703	32137-401-530	KSA 539-Y(TAPG)
Q801	32149-401-230	BU508AF
Q802	32147-401-270	KSD 288-Y (AUTO)
Q901	32137-301-530	KSC 2330-0(TAPG)
Q902	32137-301-530	KSC 2330-0(TAPG)
Q903	32137-301-530	KSC 2330-0(TAPG)
Q904	32137-301-720	KSC 815-Y (TAPG)
QS01	32137-301-720	KSC 815-Y (TAPG)
RD02	32167-406-480	1N4148 TAPG
RD03	32167-406-480	1N4148 TAPG
RD04	32167-406-480	1N4148 TAPG
RD05	32167-406-480	1N4148 TAPG
RD06	32167-406-480	1N4148 TAPG
RD07	32167-401-800	EQA02-06A/MTZ5.6B(TAPG)
RD08	32167-401-800	EQA02-06A/MTZ5.6B(TAPG)
RD09	32167-401-800	EQA02-06A/MTZ5.6B(TAPG)
RIC01	32109-110-021	PCA84C640P/030
RIC02	32109-210-008	85C72
RQ01	32137-301-720	KSC 815-Y (TAPG)
RQ02	32137-301-720	KSC 815-Y (TAPG)
RQ03	32137-401-530	KSA 539-Y(TAPG)
RQ04	32137-301-720	KSC 815-Y (TAPG)
RQ05	32137-401-530	KSA 539-Y(TAPG)
RQ06	32137-301-720	KSC 815-Y (TAPG)
RQ07	32137-401-530	KSA 539-Y(TAPG)
RQ08	32137-301-720	KSC 815-Y (TAPG)
RQ09	32137-301-720	KSC 815-Y (TAPG)
RQ10	32137-301-720	KSC 815-Y (TAPG)
RQ11	32137-301-560	KSC 2331-Y(TAPG)
		COILS
D-COIL	32479-029-210	9.3RT25L2300
DL501	32469-105-070	EFD-EN645A31M
L102	32429-020-010	0.5UH-K
L103	32429-904-580	1.5UH-K
L200	32427-805-110	1UH-M
L201	32427-803-130	10UH-K TAPG
L403	32429-805-980	6800UH-K
L404	32449-705-020	DS48-157UH
L501	32427-803-410	8.2UH-M
L502	32427-803-410	8.2UH-M
L503	32427-822-010	15UH-J TAPG
L601	32427-803-410	8.2UH-M
L801	32429-633-090	39MHX2(U)
L802	32429-226-080	1UH-K
L803	32429-226-160	4.7UH-K
L901	32429-039-090	170UH-K
LS01	32427-803-410	8.2UH-M
LS02	32427-822-010	15UH-J TAPG
X201	32469-200-000	CDL471P
X202	32469-200-004	DL471F-1
		MISCELLANEOUS
CN201	33347-108-180	67094-005 (AUTO)
CN601	33347-108-310	67094-003(AUTO)
CN901	33058-111-040	2877/F5/400
CN901	33355-211-003	YCH 250-05
CN902	33355-211-001	YCH 250-03
CN902	33058-111-021	2877,3P,400
CTN01	33347-108-310	67094-003(AUTO)
CTN02	33347-108-140	67094-006 (AUTO)
CTN04	33347-114-820	YW025-04(AUTO,NO TUBE)
F801	33167-001-001	PFC 5000-0202
F801	34709-084-730	FST 250V 3.15A 20MM SEMK

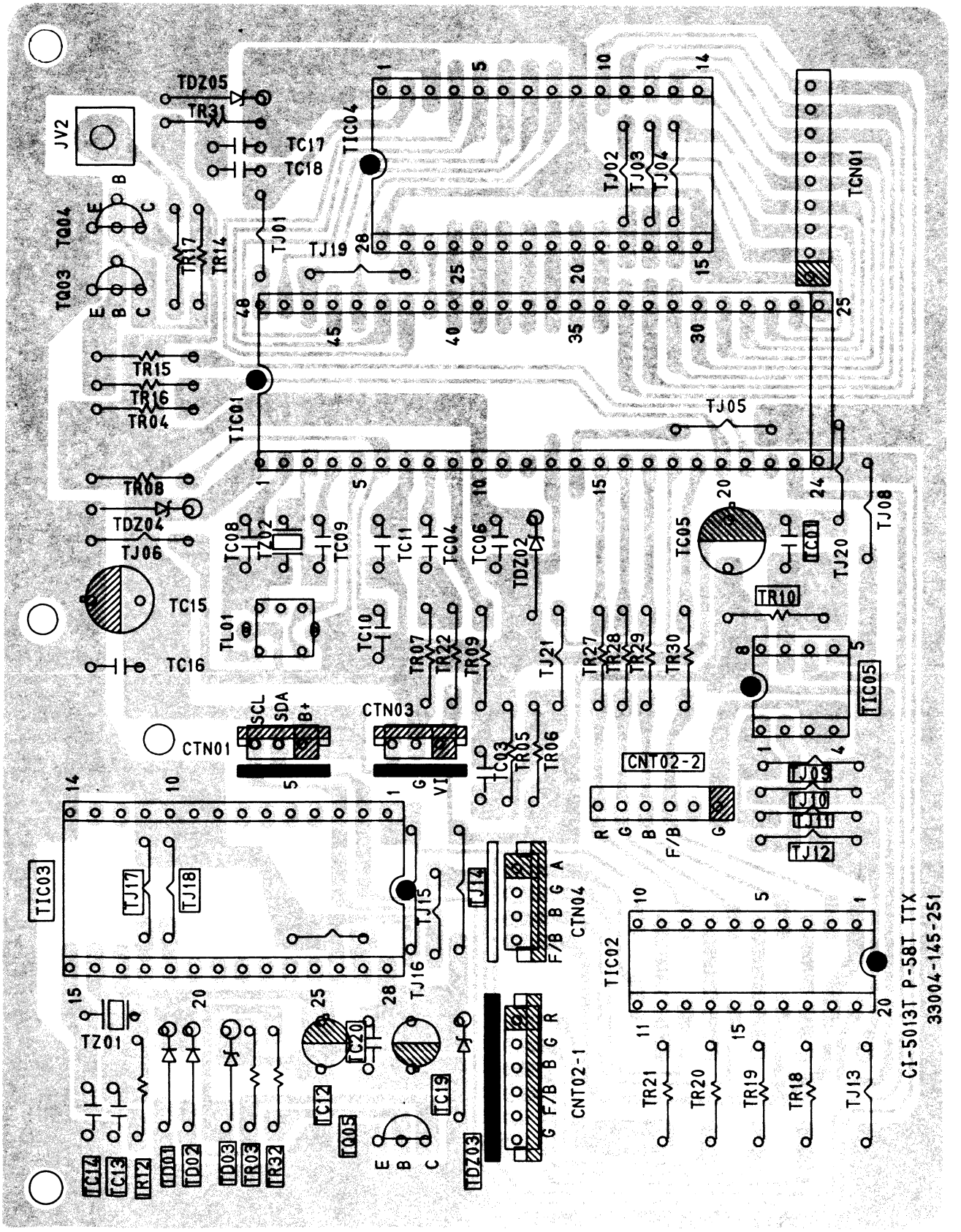
Loc No	Supplier Part No.	Description
JV2	33124-111-100	1P AUTO
L804	34047-019-060	3.5X6X1.0
L805	34047-019-060	3.5X6X1.0
L824	32499-008-010	43UH
L902	32499-004-010	25MH (K-16)
PERI	33134-103-030	HXC-1510-01-300A
RX01	34539-001-000	10MHZ
SW801	33529-402-006	ESB-99832V
SZ01	34527-460-003	SFE5.5MB TF21
SZ02	34527-460-010	SFE6.5MBTF21
T101	32717-513-800	38.9MHZ(S-60)
T401	32849-070-002	7.3MH/105UH
T402	32779-114-010	K-20-14
T444	32859-136-010	FCM-2015AL
T501	32709-024-260	4MHZ
T601	32729-601-020	5.5MHZ
T801	32899-002-405	P:160-260 S:125/18/12V
TACT-2	33606-101-010	KPT2105 ROBOT
TACT-6	33609-101-009	KPT-2105-31
TS01	32709-024-290	4.286MHZ(7CAN)
TS02	32709-024-300	4.33 MHZ(7CAN)
TU001	34519-970-010	ECC-2885CED(JACK)
V999A	33359-050-010	B12-262 BASE
X501	34539-070-210	HC-18/U,8.86723MHZ
Z101	34529-700-012	TSF5321
Z201	34529-460-010	TPS5.5MW
Z601	34527-460-003	SFE5.5MB TF21
Z602	34527-460-011	TPS6.5MBTF21
Z603	34527-460-001	TPS4.5MCTF21/EFCT4R5MW3
		2 . A S S Y - P W B S U B T T X
		*3D31-00830-030 CK5027T
PWB	33004-145-251	10X130X1.6T (S.N.A)
		RESISTORS
TR04	31018-177-103	RD 1/8T 10K-J
TR05	31018-177-512	RD 1/8T 5.1K-J
TR06	31018-177-302	RD 1/8T 3K-J
TR07	31018-177-102	RD 1/8T 1K-J
TR08	31018-177-100	RD 1/8T 10-J
TR09	31018-177-273	RD 1/8T 27K-J
TR14	31018-177-472	RD 1/8T 4.7K-J
TR15	31018-177-333	RD 1/8T 33K-J
TR16	31018-177-333	RD 1/8T 33K-J
TR17	31018-177-113	RD 1/8T 11K-J
TR18	31018-177-471	RD 1/8T 470-J
TR19	31018-177-102	RD 1/8T 1K-J
TR20	31018-177-102	RD 1/8T 1K-J
TR21	31018-177-102	RD 1/8T 1K-J
TR22	31018-177-102	RD 1/8T 1K-J
TR31	31018-177-181	RD 1/8T 180-J
		CAPACITORS
TC03	31417-109-140	CK45 TAPG F 50V 103-Z
TC04	31507-127-012	EVQB1H104J-F3/2E 63V 104
TC06	31417-109-140	CK45 TAPG F 50V 103-Z
TC08	31407-048-270	CC45 TAPG RH50V 270-K
TC09	31407-105-280	CC45 TAPG CH 50V 560-J
TC10	31507-127-012	EVQB1H104J-F3/2E 63V 104
TC11	31507-127-012	EVQB1H104J-F3/2E 63V 104
TC15	31607-401-140	CE04W TAPG 6.3V 1000M-M
TC16	31417-109-140	CK45 TAPG F 50V 103-Z
TC17	31417-109-140	CK45 TAPG F 50V 103-Z
TC18	31407-105-660	CC45 TAPG CH 50V 101-J
TC25	31407-105-280	CC45 TAPG CH 50V 560-J
TCN01	31499-009-400	B9HC0118-33N(9P 100PF)
		SEMICONDUCTORS
TDZ02	32167-408-080	EQA02-06D/MTZ6.2B(TAPG)
TDZ04	32167-408-080	EQA02-06D/MTZ6.2B(TAPG)
TDZ05	32167-406-040	MTZ 3.6A
TIC01	32109-410-017	SAA5246P/H
TIC02	32109-310-025	KS74HCTLS241
TIC04	32109-201-410	KM6264AP-10
TQ03	32159-301-020	2SC 1815-Y
TQ04	32159-301-020	2SC 1815-Y
TZ02	34537-001-018	27MHZ (TAPG)
		MISCELLANEOUS
CNT201	33347-108-140	67094-006 (AUTO)
CTN01	33058-004-024	S3XS3/F/600
CTN02	33347-108-310	67094-003(AUTO)
CTN02-	33058-017-024	S6XS6/F/600
CTN03	33058-100-596	S3XS3/2405/700
CTN03	33347-108-310	67094-003(AUTO)
CTN04	33347-114-820	YW025-04(AUTO,NO TUBE)
CTN04	33050-006-024	Y4XY4/F/600
JV2	33054-834-013	P1XP1/1015/600
TL01	32427-805-110	1UH-M

Loc No	Supplier Part No.	Description	Loc No	Supplier Part No.	Description
		3 . A S S Y - C R T			
		*3D70-00038-100 20", NOR, DARK			
V999	32019-400-015	51GGB91X			
DY	32439-090-010	DIE-1992GL			
V999M	34099-023-010	JH-8210			
SP-DY	36814-101-911	NEOPRENE VO BLK			
		4 . A S S Y - T R A N S M I T T E R			
		*3F14-00022-081 P58SC,TTX,37KEY,CI5013T			
PWB	33004-540-031	150X54X1.0T (S.N.A)			
CT01	31507-127-003	ECQ B1H 332JF3			
CT02	31507-127-003	ECQ B1H 332JF3			
CT03	31607-401-460	CE04W TAPG 16V 47M			
DT01	32167-406-480	1N4148 TAPG			
DT11	32167-406-480	1N4148 TAPG			
DTR01	32309-101-090	CL-2(F)/SSIR-5D			
DTR02	32309-101-090	CL-2(F)/SSIR-5D			
DTR03	32309-101-090	CL-2(F)/SSIR-5D			
DTR04	32309-101-090	CL-2(F)/SSIR-5D			
ICT01	32109-401-004	SAA3027P			
LT01	32427-904-914	EL 0607RA-272J			
QT01	32137-301-720	KSC 815-Y (TAPG)			
QT02	32137-401-530	KSA 539-Y(TAPG)			
RT02	31018-177-103	RD 1/8T 10K-J			
RT03	31018-177-109	RD 1/8T 1-J			
RT04	31018-177-101	RD 1/8T 100-J			
RT05	31018-177-332	RD 1/8T 3.3K-J			
RT06	31018-177-101	RD 1/8T 100-J			

SCHEMATIC DIAGRAM (TELETEXT)



CIRCUIT BOARD (PWB-TELETEXT)

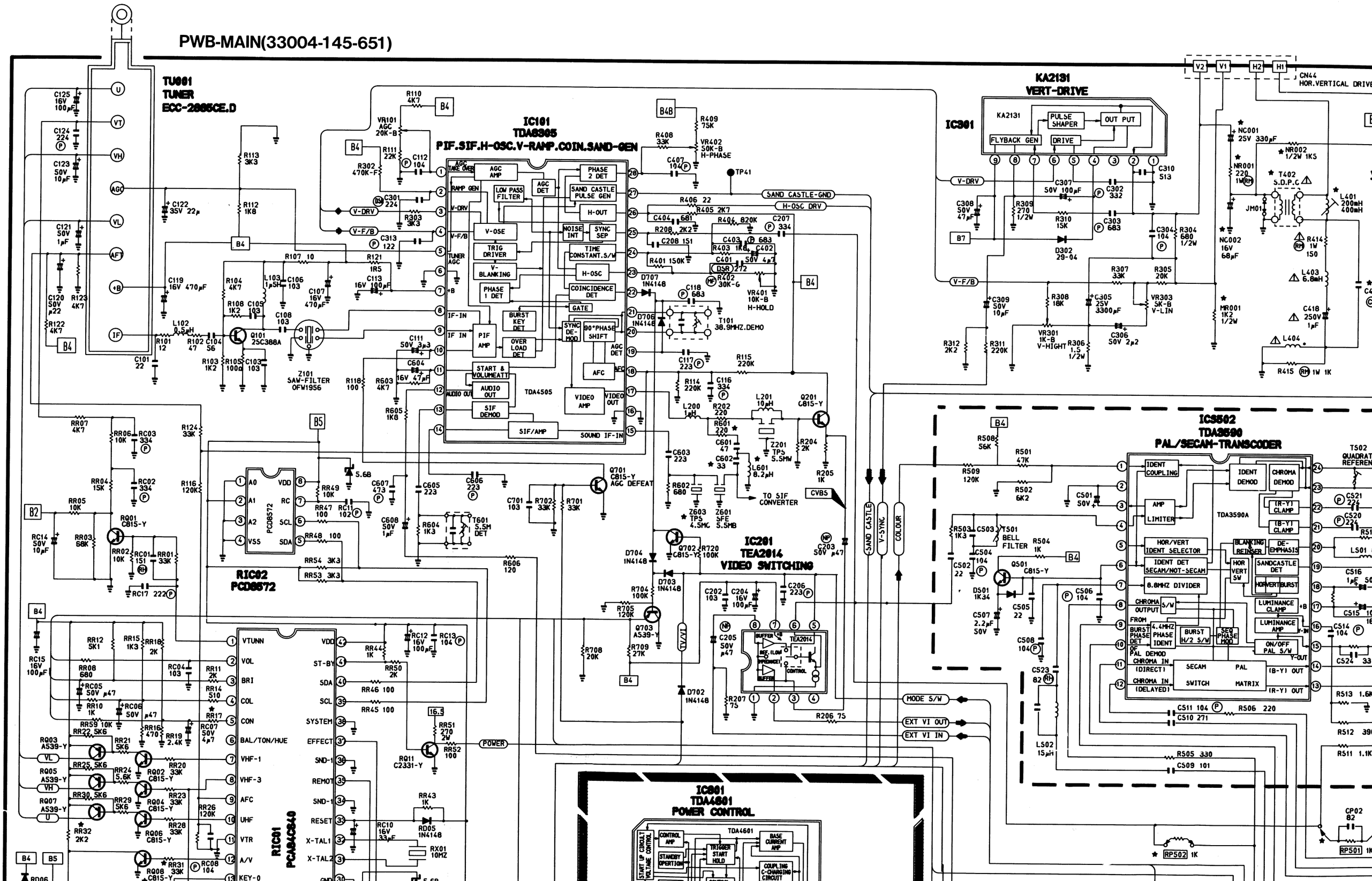


MEMO

SCHEMATIC DIAGRAM

P58SC(N)

PAL SECAM B.G D.K OPTION



KA2131
VERT-DRIVE

PULSE SHAPER
OUT PUT
DRIVE
GEN

V2 V1 H2 H1
CN44
HOR.VERTICAL DRIVE

NC001 25V 330μF
NR002 1/2W 1K5
NR001 220 1W RM
T402 S.D.P.C
JM01
L401 200mH 400mH
NC002 16V 68μF
R414 1W 150
L403 6.8mH
L404
R415 RM 1W 1K
C418 250V 1μF
C419 CH
C310 513
C307 50V 100μF
C302 332
C303 683
R310 15K
C304 104 P
R304 680 1/2W
D302 29-04
R307 33K
R305 20K
R308 18K
C305 25V 3300μF
VR303 5K-B V-LIN
VR301 1K-B V-HIGHT
R306 1.5 1/2W
C306 50V 2μ2
MR001 1K2 1/2W

B6
D404 1N4003
B7 24V
C414 35V 1000μF
D401 ERB4304
R407 220K
R921
180V
RF R412 1/2W 1
T444
TRANS-FLYBACK
Q402 H-OUT
T401 H-DRIVE
R411 1/2W 68
C408 152 P
C409 103 P
R410 270
Q401 H-DRIVE C2331-Y
C410 222
R417 56K
C405 102 P
C411 1.6KV 772 P.P
C416 100V 68μF
R824 2W 100
L824 100μH
B1
D402 ERB-4304
R416 68K
H-DRIVE
SAND CASTLE

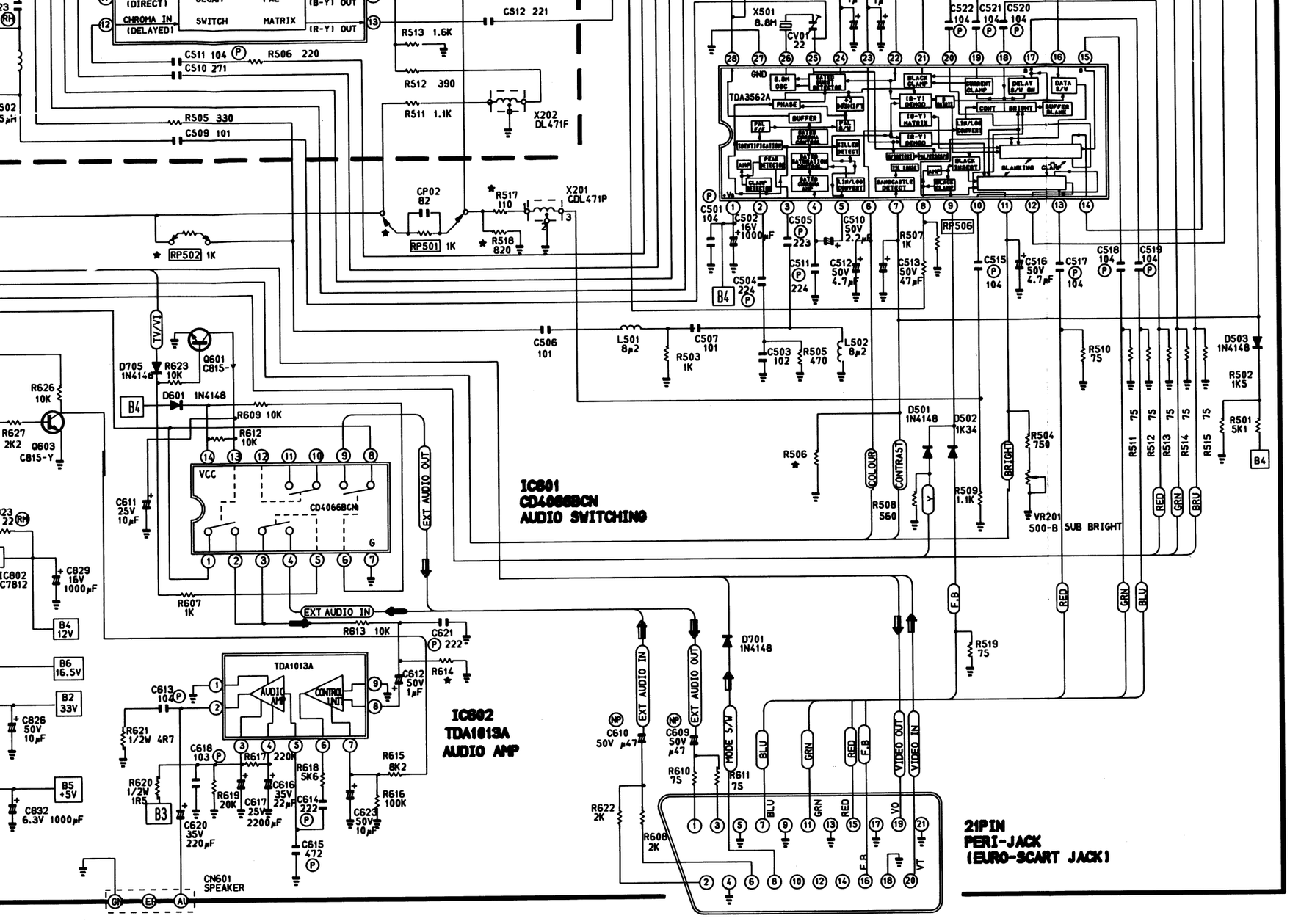
PWB-CRT
CN902
HEAT
GND
180V
L902 170μH
L901 170μH
C904 250V 1μ
C905 102 2KV
SC F0 AN
V999 COLOR PICTURE TUBE
CN901
GND
C901 68P
C907 471
R912 1/2W 82K
R915 2W 15K
R918 4.7K
VR904 5K
R901 220
Q901 C2330-0
R904 1K
VR901 1K
C902 CH 121P
C908 471
R907 2.4K
R902 220
R913 1/2W 82K
R916 2W 15K
R919 RC1/2W 4.7K
Q902 C2330-0
R905 1K
VR902 1K
C503 CH 56P
C909 471
R914 1/2W 82K
R917 2W 15K
R920 RC 1/2W 4.7K
Q903 C2330-0
VR905 5K
R903 220
R906 1K
VR903 1K
R908 1K
R909 1/2W 150
Q904 KSC815-Y
R910 330
R911 1/2W 68
+12V

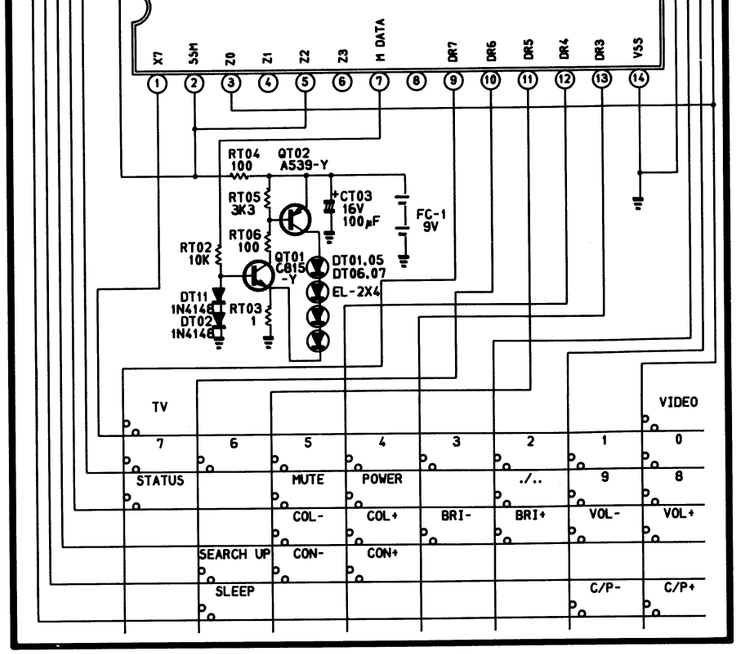
IC501
TDA3562A
CHROMA DECORDER
B4
D506 1N4148
D508 1N4148
D507 1N4148
CN901
12 B G R GND

PWB-TRANSMITTER
ICT01
SAA3027P
CT01 332 P
CT02 332 P
LT01 2.7mH
SAA3027P
VDD X6 X5 X4 X3 X2 X1 X0 OSC2 TP OSC1 DR0 DR1 DR2
X7 SSM Z0 Z1 Z2 Z3 H DATA DR7 DR6 DR5 DR4 DR3 VSS
RT04 100
QT02 A539-Y
RT05 3K3
RT06 100
RT02 10K
QT01 C815-Y
+CT03 16V 100μF
FG-1 9V
DT01.05 DT06.07 EL-2X4
DT11 1N4148
DT02 1N4148
RT03 1

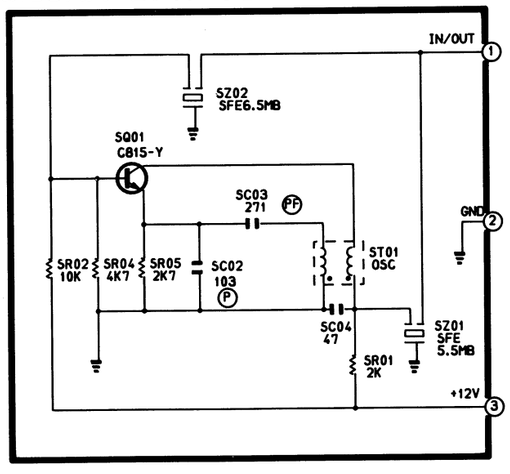
IC3502
TDA3590
PAL/SECAM-TRANSCODER
IDENT COUPLING
IDENT DEMOD
CHROMA DEMOD
AMP LIMITER
TDA3590A
(R-Y) CLAMP
(B-Y) CLAMP
HOR/VERT IDENT SELECTOR
IDENT DET SECAM/NOT-SECAM
8.8MHZ DIVIDER
BLANKING REINSER
DE-EMPHASIS
HOR VERT SW
SANDCASTLE DET
HORVERTBURST
CHROMA OUTPUT S/W
LUMINANCE CLAMP
LUMINANCE AMP
FROM BURST PHASE DET OF PAL DEMOD
4.4MHZ PHASE IDENT
BURST H/2 S/W
SEQ PHASE MOD
ON/OFF PAL S/W
CHROMA IN (DIRECT)
CHROMA IN (DELAYED)
SECAM SWITCH
PAL MATRIX
(B-Y) OUT
(R-Y) OUT
Y-OUT
TS02 QUADRATURE REFERENCE
CS22 221
VR501 1K-B
CS21 224 P
CS20 224 P
R517 2K
CS19 471
LS01 8μ2
CS18 30
R516 1K2
D502 1N4148
CS16 1μF 50V
CS17 33
CS15 100μF 16V
R514 1R5
B4
CS14 104 P
R507 910
CS24 33
CS13 221
CS12 221
R513 1.6K
R512 390
R511 1.1K
X202 DL471F
CS01 50V
R504 1K
C815-Y
CS06 104 P
CS23 82 RH
LS02 15μH
CS11 104 P
CS10 271
R506 220
CS05 101
CP02 82
R517 110
X201 CDL471P
RP501 1K
R518 820
RP502 1K
SAND CASTLE
JP03
JP02
JP01

MATRIX-ADJ
R524 510
T501
CP01 103
VR501 2K-B
DL501 1H 31M
L503 15μH
R520 120K
C526 221
R522 2K4
R523 910
C525 50V 6μ8
R521 560
C524 50V 1μ
C523 50V 1μ
X501 8.8M
CV01 22
C522 104 P
C521 104 P
C520 104 P
TDA3562A
RP506
C501 104
C502 16V 1000μF
C505 P 223
C510 50V 2.2μF
R507 1K
C511 P 224
C512 50V 4.7μF
C513 50V 47μF
C515 P 104
C516 50V 4.7μF
C517 P 104
C518 104 P
C519 104 P
R210 MF
R209 1K-F MF
C209 334 P
D201 1N4003
B4





SECAM-D/K SIF CONVERTER



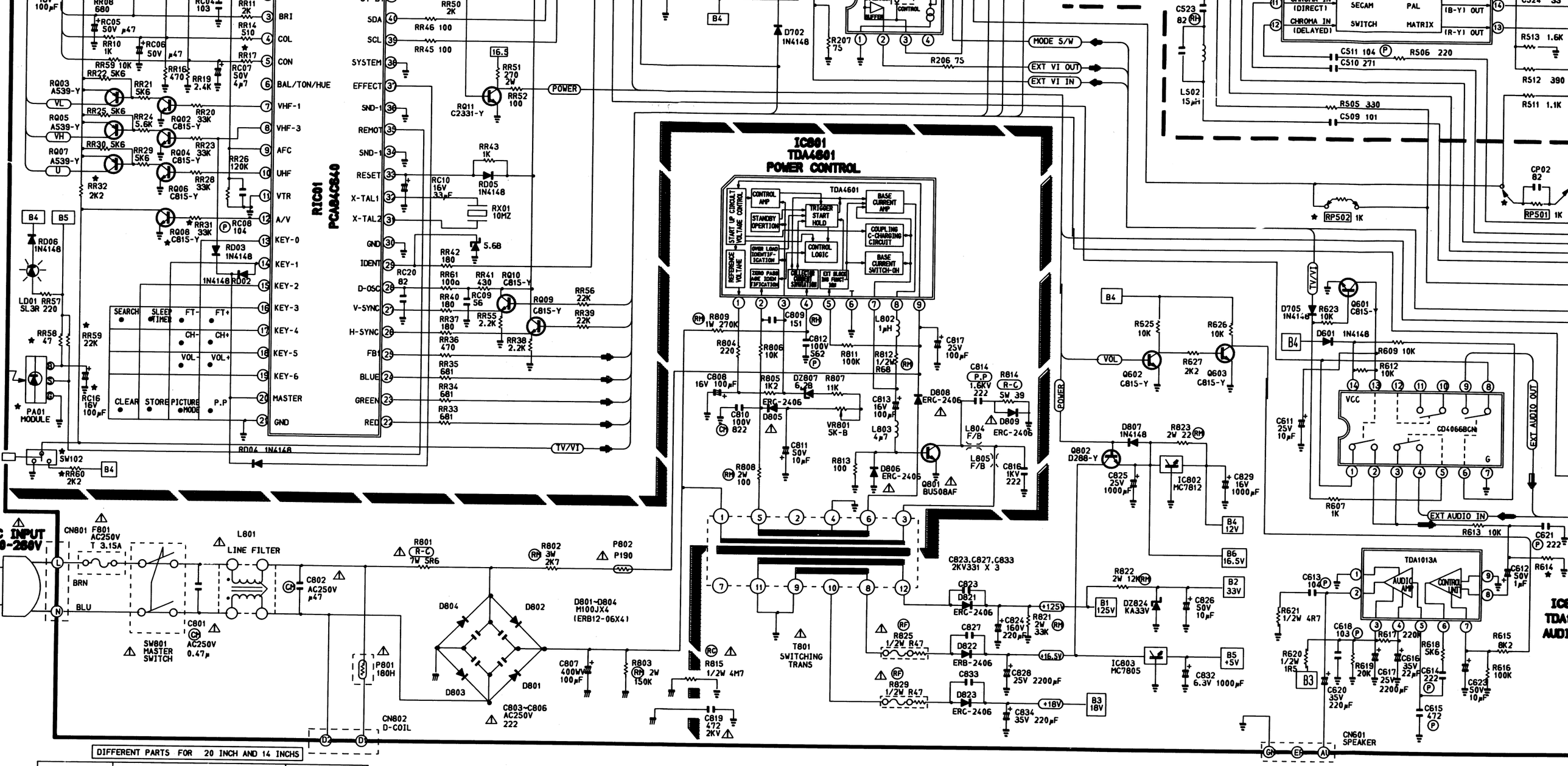
OBSERVATION OF VOLTAGES AND WAVEFORMS

Voltages read with "VTVM" from point shown to chassis ground, line voltage 220/240V colour bar signal.
Voltages reading may vary ±20%.
The schematic shown is representative only.
All wavefroms are taken using a wide band oscilioscope and a low capacity probe.
Check FINE TUNING,AGC,BRIGHTNESS,CONTRAST,and COLOUR controls for best picture.
Waveforms are taken using a standard colour bar signal.

EXPRESSION

1 Resistance is shown ohm K=1,000 M=1,000,000.
2 Unless otherwise noted in schematic all capacitor values less than 1 are expressed in mfd,the values more than 1 in pF.
3 Unless otherwise noted in schematic all inductor values are expressed in uH,and the values less than 1 in mH.

NOTE
The circuits are subject to change without notice to improve the picture quality.



DIFFERENT PARTS FOR 20 INCH AND 14 INCHS

LOCATION	14 INCH		20 INCH
	NORMAL	MINI-NECK	
NR002	1/2W 1K5		1/2W 1K5
NC001	25V 330μF		25V 330μF
NC002	16V 68μF		16V 68μF
R614	3K3	3K3	4K3
R210	133K-F(1/2W)	133K-F(1/2W)	127K-F(1/2 W)
C419	200V 364		200V 434
L401		200mH/480mH	
L404	DS48-157μH	K10/195μH	DS48-157μH
T402	K-20-14		K-20-14
Q402	2SD1650	2SD1650	2SD1651
T444	FCM1415AL	FCM-14A004	FCM-2015AL
V999	3720B22	A34EAC00X	51GGH91X
RR17	3K	3K	1K
RR19	2K4	2K4	3K
RS06	8K2	8K2	10K
L902	12μH	43μH	25μH
R921	RF1P(0.47)	RF1P(1)	RF1P(1)

DIFFERENT PART
FOR SOFT-TOUCH AND REMOCON MODEL

LOCATION	SOFT-TOUCH	REMOCON
SW102	KSA-2272	
RR60	2K2	
PA01		GPIU721Q
RC16		16V 100μF
RR58		1/8W 47
RR59		1/8W 22K
RR32		1/2 W 2K2
RR31		1/8W 33K
RQ08		C815-Y

DIFFERENT PARTS FOR
PAL-B/G AND SECAM-B/G,D/K

LOCATION	PAL-B/G	PAL-B/G SECAM-B/G	PAL-B/G SECAM-B/G SECAM-D/K
RS17	1K	110	110
RS18	620	820	820
RP501	820		
RP502	1K		
CP01	103		
R601	220Ω	220Ω	75Ω
C602	47	47	33P
L601	12μH	12μH	8.2μH
CP02	82 (RH)		
Z603			TPS4.5MC

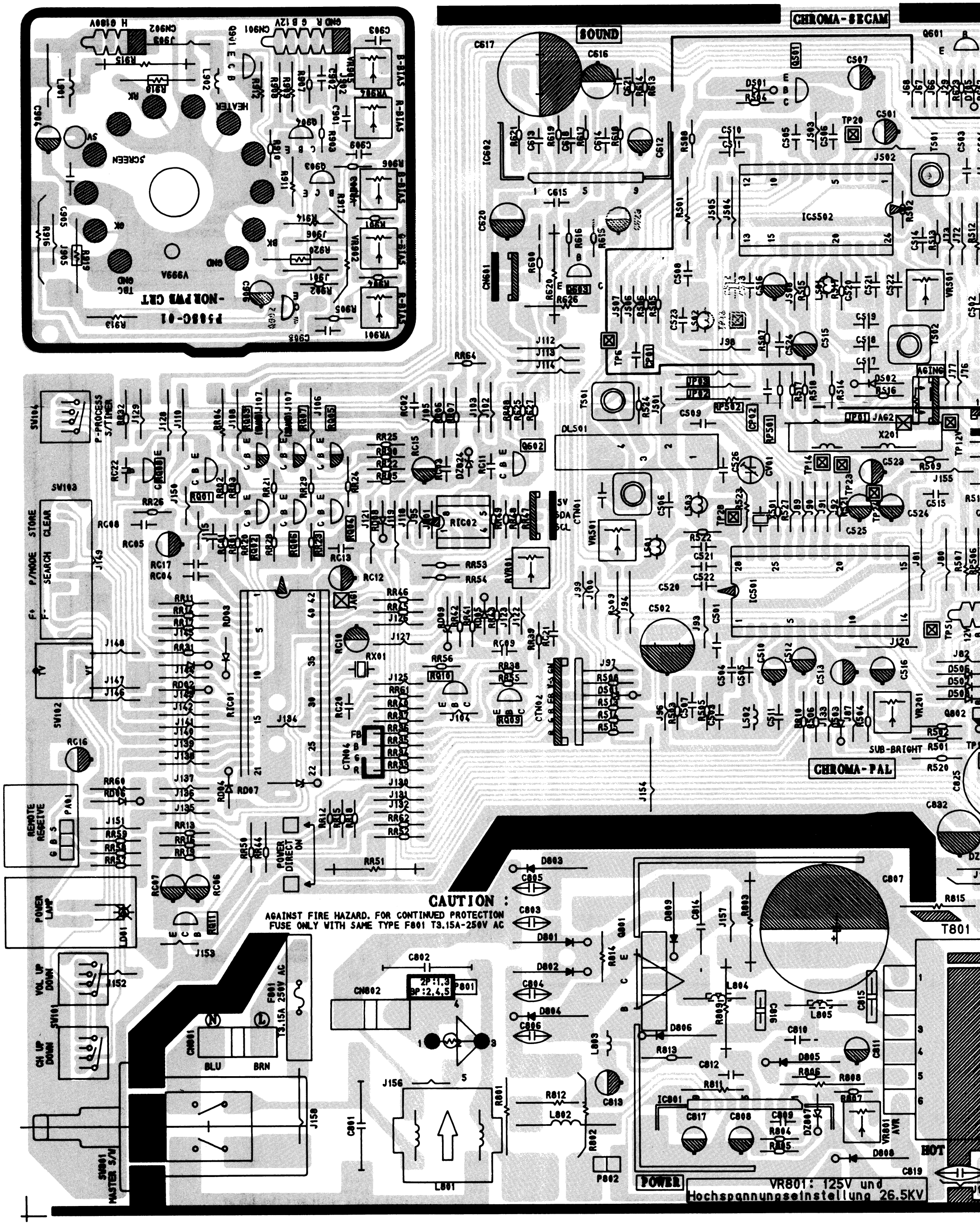
RESISTOR	
TYPE	MARK
Carbon Composition	C
Oxide Metal Film	M
Metal Film	RM
Cement	R-C
Variable Resistor	
Positive Resistor	

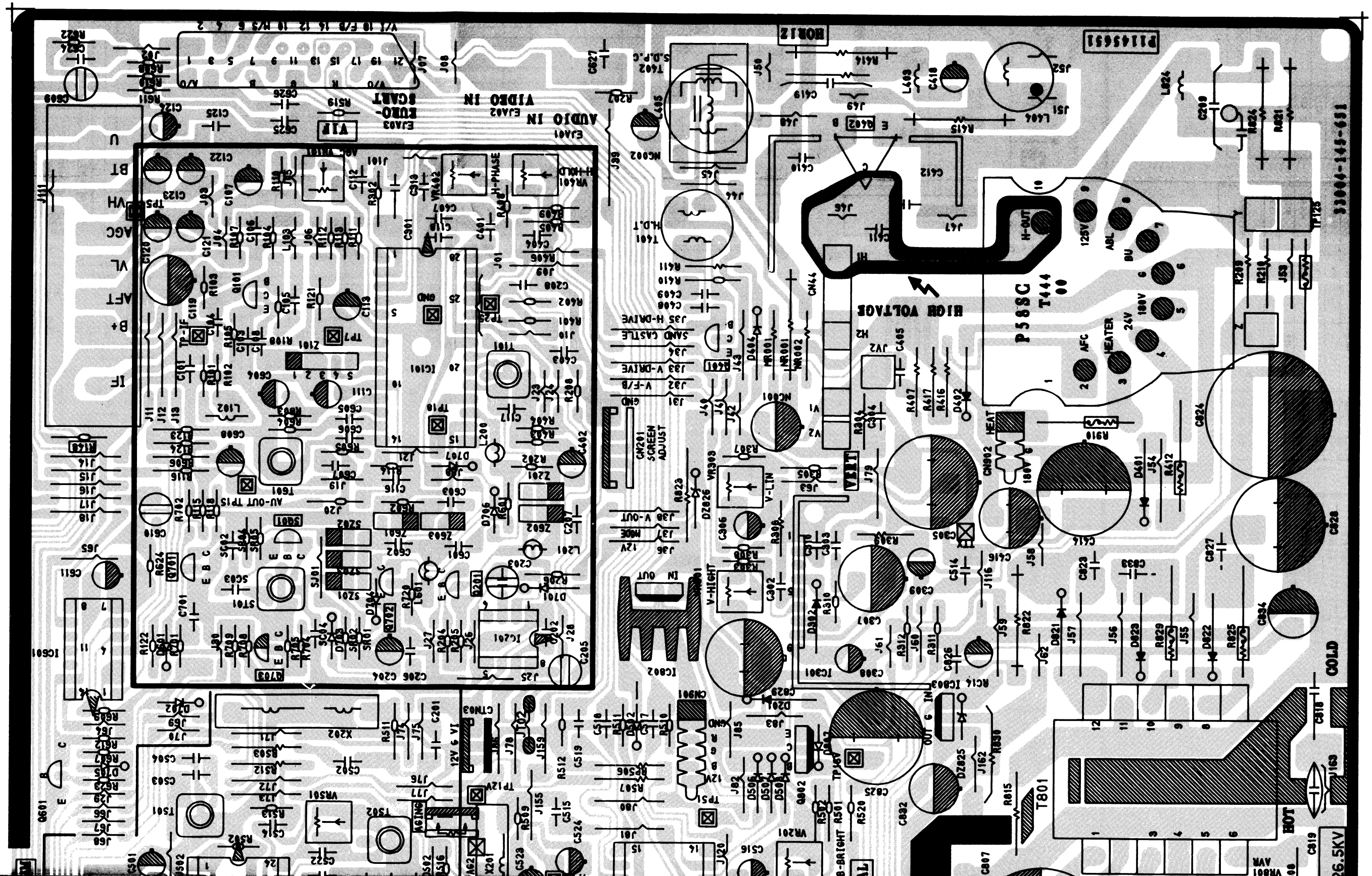
CAPACITOR	
TYPE	MARK
Ceramic	No Mark
Polyester	P
Tantalium	T
Metal Polyester	MP
Polypropylene	P.P
Polyester Polypro	DSR
Chemical Electrolytic	
Chemical Non-Polar	

OBSERVATION OF VOLTAGES AND WAVEFORMS

1 Voltages read with "VTVM" from point shown to chas
voltage 220/240V colour bar signal.
2 Voltages reading may vary ±20%.
3 The schematic shown is representative only.
4 All wavefroms are taken using a wide band oscillos
capacity probe.
5 Check FINE TUNING,AGC,BRIGHTNESS,CONTRAST,and COLOU
best picture.
6 Waveforms are taken using a standard colour bar si

CIRCUIT BOARD
P58SC (N)
PWB-MAIN (33004-145-651)




P1145651
3300-145-651
HORIZ
HIGH VOLTAGE
P58SC
T444
00
VERT
COLD
HOT
T801
AUDIO IN
VIDEO IN
EURO-SCART
AU-OUT TP15
SAND CASTLE
J35 H-DRIVE
J34
J33 V-DRIVE
J32 V-F/B
J31 GND
J30 V-OUT
J29 MODE
J28 12V
SCREEN ADJUST
V-LIN
V-HIGHT
H-PHASE
H-HOLD
V-HOLD
H-DRIVE
H-OUT
AFC
HEATER
HEAT
180V
24V
125V
ABL
BU
AGC
VL
AFT
B+
IF
BT
VH
U
12V & V1
AGING
IN
OUT
GND